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FOREIGN AGRICULTURE REPORT

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SOME ASPECTS OF WESTERN EUROPE AS A CITRUS MARKET

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FOREWORD

In prewar years the United States normally exported approximately 10 percent of its citrus production, and Western Europe was the most important export customer. After the war the disappearance of wartime market outlets made the re-establishment of European markets desirable.

This study of some current aspects of the European citrus market supplements information published in circulars on the citrus markets in Norway, Sweden, Denmark, the Netherlands, Belgium, Western Germany, Switzerland, France, and the United Kingdom.

Information has been included which, it is hoped, will be helpful to the exporter in identifying foreign varieties and fruit sizes and interpreting competitive prices in the Antwerp auctions. The information on the United Kingdom's health program should be useful to the processor in appraising future outlets for orange juice concentrates and bottlers' bases.

The data on production in countries supplying the Western European market together with the tabulation of total citrus imports in nine European countries should aid in evaluating the potential of this market as an outlet for United States citrus and citrus products.

This study was made in the interests of the United States citrus industry by the Office of Foreign Agricultural Relations with funds provided by the Research and Marketing Act as a part of the program to develop foreign markets for agricultural commodities in plentiful supply.

Joseph A. Becker

Joseph A. Becker, Chief
International Commodities Branch

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The author wishes to acknowledge the cooperation of Leon Van Parys, Gerard Koninckx Freres, and B. M. Spiers and Son, the three fruit auction firms at Antwerp which have supplied the Department with priced catalogs of their fruit sales for over a year at considerable trouble and expense.

The author also wishes to express his appreciation to the staff of OFAR - to Gustave Burmeister for assistance in planning the survey, and to Ruth Tucker, Marguerite Golden, and Christine Hudson for statistical assistance.

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SUMMARY AND CONCLUSIONS

In the postwar period the desire to consume citrus has increased in Western Europe. In countries with colonial sources of supply or adequate foreign exchange, supplies have been plentiful, and in Sweden, Belgium, Switzerland, France, and Denmark the consumption of oranges has been at much higher levels than before the war. This group of countries imported 19.2 million boxes of oranges in 1949, compared with 10.5 million in 1938. The increased desire to consume oranges is also present in countries such as the United Kingdom, Norway, the Netherlands, and Western Germany where imports have been restricted by lack of foreign exchange. If these countries were to import only as much as their prewar total there would be an increased market in Western Europe for about 8 million boxes of oranges over and above the 33.2 million boxes imported in 1949.

Until 1950 the total production of countries other than the United States which supply winter oranges to the Western European market was at least 10 million boxes less than the high average production of oranges in 1929-32. The increased production in 1950 reversed the declining trend of recent years; however, it is unlikely that the 1932 level of 60 million boxes will be exceeded for some years, even with the estimated increases in production which may be expected from North Africa and Italy. In view of present production levels and increased consumption in producing areas, no surpluses of winter oranges are anticipated for some time.

Present production of summer oranges is above prewar levels, but there is no immediate prospect of greatly increased supplies. The increased desire to consume oranges and the relatively stable supplies from South Africa indicate that the summer orange market will be profitable in the future. It is in this season that the opportunity for United States fresh citrus exports will occur. Under present conditions there are potential opportunities for the export of about 5 million boxes of summer oranges. The realization of this potential will depend to some extent on the abilities of the United States citrus industry to take advantage of opportunities as they occur.

The production of tangerines and clementines is increasing in the Mediterranean supplying areas, and surpluses of these varieties may be expected. The large supplies of these fruits available in November and December may depress prices of winter oranges, and the distress marketing of surpluses in January and February may also be a disturbing factor in winter orange marketing in Western Europe.

Grapefruit production in supplying countries other than the United States has declined somewhat from the 1947 peak, but ample supplies are available for the European markets. Consumption has not increased and surpluses occasionally existed in the 1949-50 marketing season, even under the present moderate supply situation. In October and November 1950, South African grapefruit was surplus in Sweden, Belgium and England. Opportunities exist for small exports of high-quality United States grapefruit, particularly of the pigmented type which is unique in the markets of Belgium and Switzerland and Sweden where it is known and appreciated. The European market prefers grapefruit in the 150 to 96 size range, smaller fruit than is sold in the United States market.

The production of lemons in Mediterranean areas is continuing to decline, and there is no prospect of a marked change in production levels in the future. Since supplies are much lower than formerly, there are opportunities for the export of United States fresh lemons in the summer months and for some lemon processed juices throughout the year.

Foreign exchange shortages will probably continue to limit United States citrus exports in the near future, but the increasing demand for citrus in Europe will create export opportunities particularly in the summer months. The present situation indicates that the potential of total United States citrus exports to Western Europe is about half that of prewar years.

At present, citrus is exported primarily as fresh fruit; however, the establishment of health programs using orange juice concentrate and the increasing use of citrus-flavored soft drinks will probably tend to increase the importance of processed citrus products as an export commodity. The United States industrialized citrus industry produces processed products which are competitive with the world in quality and price. Opportunities exist for the export of limited quantities of frozen products to Belgium and Switzerland, but the bulk of the processed juice exports will continue to be "hot pack" products for some time.

The potentials of the export market will be realized only if the United States citrus industry is willing and able to do the necessary merchandising to earn its place in world markets. Increased export opportunities will not be a gift, but will be the result of well-applied effort.

CITRUS SUPPLIES FOR WESTERN EUROPEAN MARKETS

The situation as regards the supplies of citrus for Western European markets is influenced by production trends in the various citrus-producing countries. The 1925-50 production of the most important supplying countries other than the United States is given in Tables 1-5 and Figures 1-5.

Winter Oranges

The term winter orange is applied to fruit which is commonly marketed from November through May. Italy, Spain, Palestine, French Morocco, and Algeria are the largest suppliers of winter oranges for the European market. Total production in these countries declined from the relatively high average of 57 million boxes in the 1929-32 period to 45 million in the 1939-42 period, and in 1949 the total was 44 million boxes. This decline in total production was primarily due to the decrease in production of oranges in Spain, which was greater than the increases in the newer orange-producing countries such as French Morocco and Algeria.

In 1950 this trend was changed by the larger crops in Spain and Italy, and total production reached about 58 million boxes. Even with the large crops produced in the Mediterranean area in this year, the total production of these supplying countries was 2 million boxes less than in 1932. This level is likely to be maintained, and total production in the next few years may be expected to range between 55 and 60 million boxes.

The factor not to be overlooked in estimating the potential total supplies of winter oranges to European markets is the increase in domestic consumption of citrus in the last 10 years in several of the citrus-producing areas because of changing economic conditions and increased population. The increased domestic consumption in North Africa, Palestine, Italy, and Spain is reducing the amount of citrus which is available for export.

Summer Oranges

Summer orange is the term applied to fruit which is commonly marketed between the months of May and November. South Africa and Brazil are the two primary traditional suppliers of summer oranges to Europe. The production of summer oranges in these countries followed an entirely different pattern than production in the countries supplying winter oranges. Total supplies in these two areas expanded rapidly to a level of about 40 million boxes in the 1938-43 period, fell to about 35 million during the war years, and then recovered to the prewar level. In 1950 total production was the

highest on record, but it was only slightly above the 1942 level. No rapid increase in production is indicated, and total supplies of summer fruit will probably be less than 45 million boxes for some time.

Reference was made to total supplies of summer oranges, but only a small portion of Brazil's production is available for export to Europe since the domestic market and Argentina will continue to be the most important markets for Brazilian fruit. South African production has been nearly stable since 1942, and there is no immediate prospect that future shipments will be above levels of the past few years.

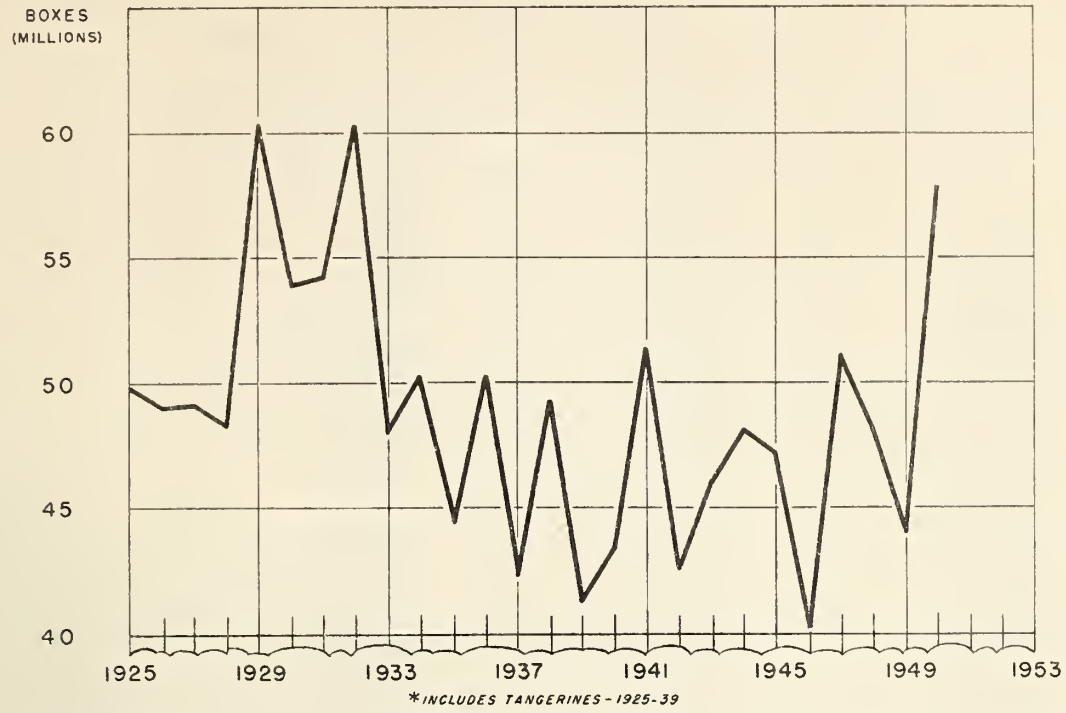
Table 1.-Winter Oranges: Production in Specified Countries, 1925-50

Year	Italy	Spain	Palestine	French Morocco 1/	Algeria	Total
	1,000 boxes	1,000 boxes	1,000 boxes	1,000 boxes	1,000 boxes	1,000 boxes
1925	10,105	36,896	1,515	190	1,169	49,875
1926	12,477	32,884	2,659	200	866	49,086
1927	10,055	35,749	2,210	240	929	49,183
1928	10,073	35,276	1,787	300	941	48,377
1929	11,140	45,205	2,591	400	870	60,206
1930	12,482	37,676	2,425	500	889	53,972
1931	11,281	37,927	3,585	500	912	54,205
1932	17,324	36,881	4,230	525	1,358	60,318
1933	10,688	30,461	5,158	525	1,074	47,906
1934	11,463	30,541	6,625	534	1,104	50,267
1935	9,008	28,654	4,992	610	1,221	44,485
1936	11,426	27,191	9,191	823	1,595	50,226
1937	9,527	20,686	9,573	915	1,624	42,325
1938	10,966	22,046	13,056	1,067	2,066	49,201
1939	9,092	22,260	6,448	1,219	2,307	41,326
1940	9,615	23,514	7,200	1,172	1,950	43,451
1941	10,510	27,334	9,870	1,302	2,330	51,346
1942	9,322	24,921	5,000	1,419	1,969	42,631
1943	9,952	24,901	8,400	1,122	1,696	46,071
1944	7,311	30,576	7,000	1,358	1,900	48,145
1945	8,377	26,603	8,000	1,653	2,606	47,239
1946	10,059	17,772	9,199	1,638	1,543	40,211
1947	10,394	22,801	13,000	2,457	2,349	51,001
1948	11,115	22,354	2/ 6,300	4,189	4,281	48,239
1949	8,277	20,962	2/ 5,750	4,465	4,727	44,181
1950	12,535	28,988	2/ 5,300	5,068	5,940	57,831

1/ Includes tangerines 1925-39.
2/ Israel.

Source: Compiled from official figures.

WINTER ORANGES: PRODUCTION IN ITALY, SPAIN, PALESTINE, FRENCH MOROCCO,* AND ALGERIA, 1925-50



*INCLUDES TANGERINES - 1925-39

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SUMMER ORANGES: PRODUCTION IN SOUTH AFRICA AND BRAZIL, 1925 - 50

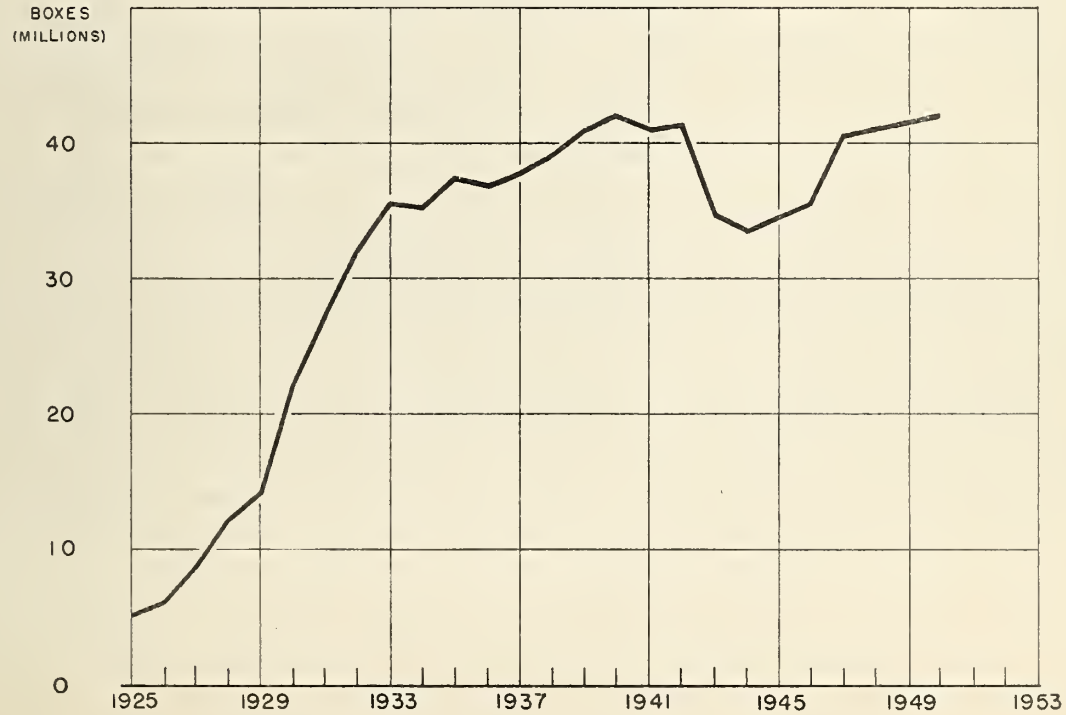

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Table 2.-Summer Oranges: Production in Specified Countries, 1925-50

Year	South Africa	Brazil	Total
	1,000 boxes	1,000 boxes	1,000 boxes
1925	700	4,500	5,200
1926	1,060	5,000	6,060
1927	840	8,000	8,840
1928	1,200	11,000	12,200
1929	2,100	12,000	14,100
1930	2,000	20,000	22,000
1931	2,000	25,000	27,000
1932	2,300	29,613	31,913
1933	2,600	32,914	35,514
1934	2,500	32,753	35,253
1935	2,700	34,889	37,589
1936	4,350	32,453	36,803
1937	3,500	34,374	37,874
1938	5,000	34,256	39,256
1939	4,450	36,360	40,810
1940	5,835	36,079	41,914
1941	5,990	34,962	40,952
1942	6,079	35,465	41,544
1943	6,860	27,804	34,664
1944	4,827	28,621	33,448
1945	4,505	29,967	34,472
1946	5,326	30,085	35,411
1947	5,607	34,825	40,432
1948	5,863	35,138	41,001
1949	5,787	35,674	41,461
1950	6,000	36,000	42,000

Source: Compiled from official figures.

Tangerines and Clementines

Total production of tangerines and clementines in Algeria, French Morocco, Spain, and Italy increased between 1928 and 1943. From a relatively low volume of 2 million boxes in the late 1920's supplies increased to a high of 6 million boxes in 1943. Production then declined to 4.3 million boxes in 1947, but the increasing trend was resumed in 1948, and total production reached 6.3 million boxes in 1950. With increased planting of these varieties in North Africa and Italy, production may continue to increase for several years, and a total tangerine crop from these sources of 8 million boxes is possible within the next 10 years.

These varieties are marketed in the winter season and are sold primarily in November and December. After the Christmas holidays, the price usually shows a decline which makes shipments less profitable. The increasing production and short marketing period seem to indicate that surpluses of these varieties may be encountered in the immediate future in the European market.

Lemons

The supplies of lemons for Europe are traditionally furnished primarily by Italy and Spain; however, other suppliers are Chile, Algeria, and Palestine. In the late 1920's supplies averaged about 15 million boxes, but the general level of supplies in 1948-50 was only about 9.5 million boxes. This decline in the production of lemons is primarily a result of the reduction of lemon-producing acreage in Italy, where groves were destroyed by the fungus disease, mal secco.

Decreased production has not had the effect on the fresh fruit market in Europe that might be expected. In the earlier years of high production a large percentage of the lemons produced in Italy were utilized in the byproducts industry primarily for the production of citric acid, but since the development of more economical methods for the production of this acid smaller quantities of fruit are now utilized for this purpose.

The fact remains, however, that the supply of lemons available for the Western European market is much smaller than in the past and is likely to continue to be so for some years to come, since there is no indication of any great increase in either acreage or production.

Grapefruit

Grapefruit is a relatively minor citrus variety on Western European markets, and the supplies come from many sources. This fruit is of comparatively recent origin in some of the supplying countries, and data regarding production are only available since 1935. Total production from Palestine, Algeria, Morocco, Surinam, South Africa, Cuba, Trinidad, and Jamaica, is approximately the same now as it was in 1936. Although the market for grapefruit in Western Europe is tending to increase somewhat as Europeans learn to utilize this particular fruit, the supplies are probably quite adequate to take care of any increase in consumption.

Table 3.-Tangerines and Clementines: Production in Specified Countries, 1925-50

Year	Algeria	French Morocco 1/	Spain 2/	Italy	Total
	1,000 boxes	1,000 boxes	1,000 boxes	1,000 boxes	1,000 boxes
1925	1,647			1,015	2,662
1926	949			1,254	2,203
1927	972			1,010	1,982
1928	789			1,012	1,801
1929	836			1,349	2,185
1930	781			1,650	2,431
1931	897			1,759	2,656
1932	1,041			2,057	3,098
1933	1,173			1,179	2,352
1934	1,087			1,638	2,725
1935	1,197			1,761	2,958
1936	1,209			1,861	3,070
1937	1,529			1,597	3,126
1938	1,248			1,968	3,216
1939	1,845			1,298	3,143
1940	1,621	350		1,751	3,722
1941	1,760	390		2,412	4,562
1942	1,579	426		2,211	4,216
1943	1,752	342	2,265	1,669	6,028
1944	1,321	408	2,803	1,178	5,710
1945	1,023	496	2,060	1,338	4,917
1946	1,512	220	1,029	1,580	4,341
1947	1,367	290	932	1,700	4,289
1948	2,548	280	1,222	1,805	5,855
1949	1,998	504	688	1,571	4,761
1950	2,151	598	1,550	1,953	6,252

1/ Included with oranges 1925-39.

2/ Included with oranges 1925-42.

Source: Compiled from official figures.

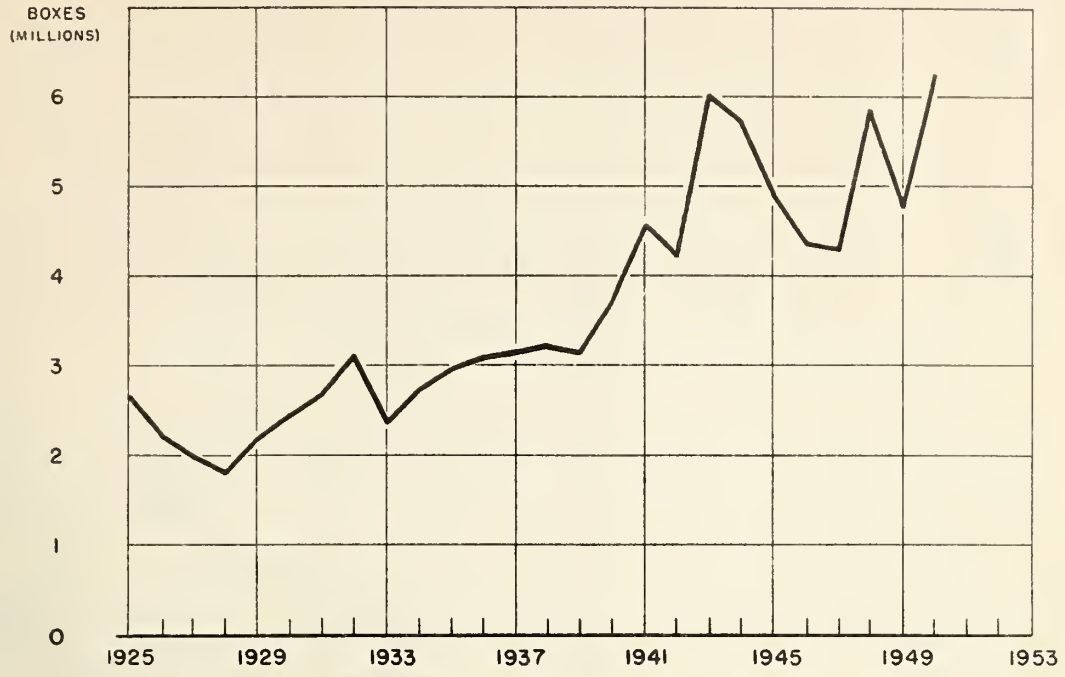
Table 4.-Lemons: Production in Specified Countries, 1925-50

Year	Italy	Spain	Chile	Algeria	Palestine	Total
	1,000 boxes	1,000 boxes	1,000 boxes	1,000 boxes	1,000 boxes	1,000 boxes
1925	13,080	1,377		161	4	14,622
1926	16,151	1,368		117	10	17,646
1927	13,015	1,587		111	10	14,723
1928	13,038	1,524		111	13	14,686
1929	15,079	1,586		91	6	16,762
1930	15,154	1,699		108	5	16,966
1931	11,283	1,538		101	8	12,930
1932	18,598	1,714		136	16	20,464
1933	13,024	1,724		112	22	14,882
1934	11,155	1,582		99	26	12,862
1935	10,253	1,481		103	50	11,887
1936	8,247	1,479		112	72	9,910
1937	8,662	1,400		116	77	10,255
1938	11,330	1,400		81	142	12,953
1939	9,694	1,463		97	100	11,354
1940	9,897	1,577	300	94	100	11,968
1941	9,860	1,029	350	105	70	11,414
1942	9,202	1,085	417	89	60	10,853
1943	8,092	1,573	296	95	60	10,116
1944	6,784	1,431	380	82	312	8,989
1945	6,373	1,438	458	112	350	8,731
1946	7,138	1,083	658	102	353	9,334
1947	8,137	1,339	1,146	92	500	11,214
1948	7,386	812	1,167	159	1/ 250	9,774
1949	6,768	870	1,146	186	1/ 100	9,070
1950	6,933	1,244	1,150	75	1/ 100	9,502

1/ Israel only - about 90 percent of total Palestine acreage.

Source: Compiled from official figures.

TANGERINES*AND CLEMENTINES* PRODUCTION IN ITALY, SPAIN, FRENCH MOROCCO, AND ALGERIA, 1925-50



*DATA FOR FRENCH MOROCCO AND SPAIN INCLUDED WITH ORANGES 1925-39

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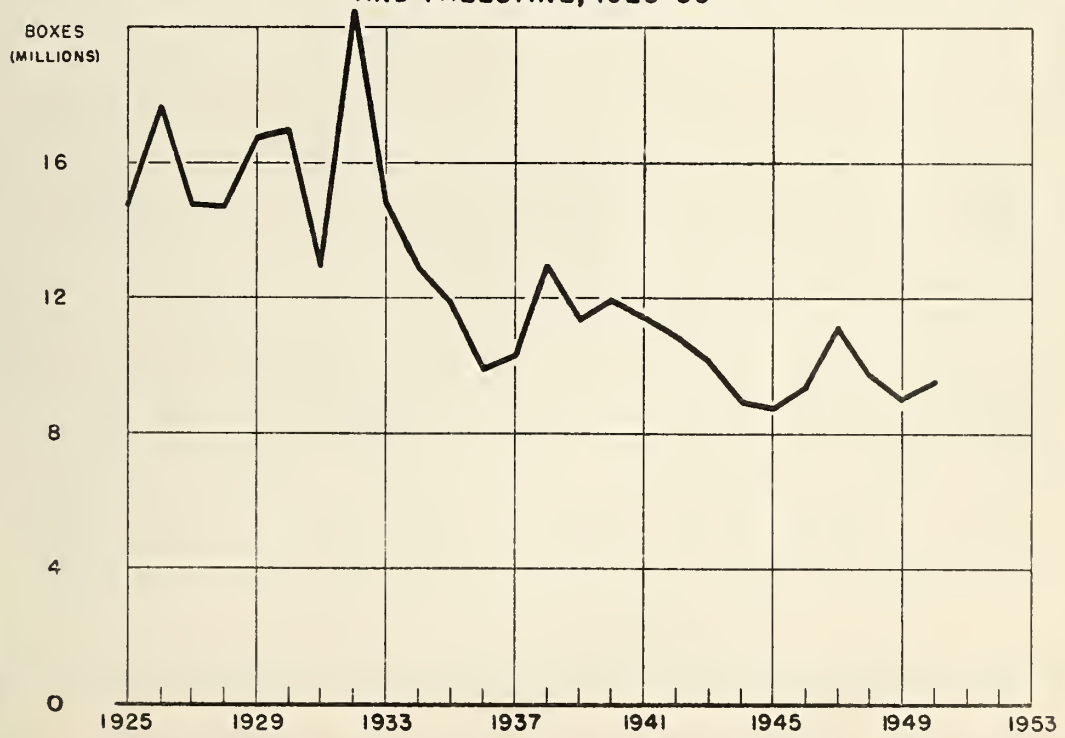
LEMONS: PRODUCTION IN ITALY, SPAIN, CHILE, ALGERIA, AND PALESTINE, 1925-50



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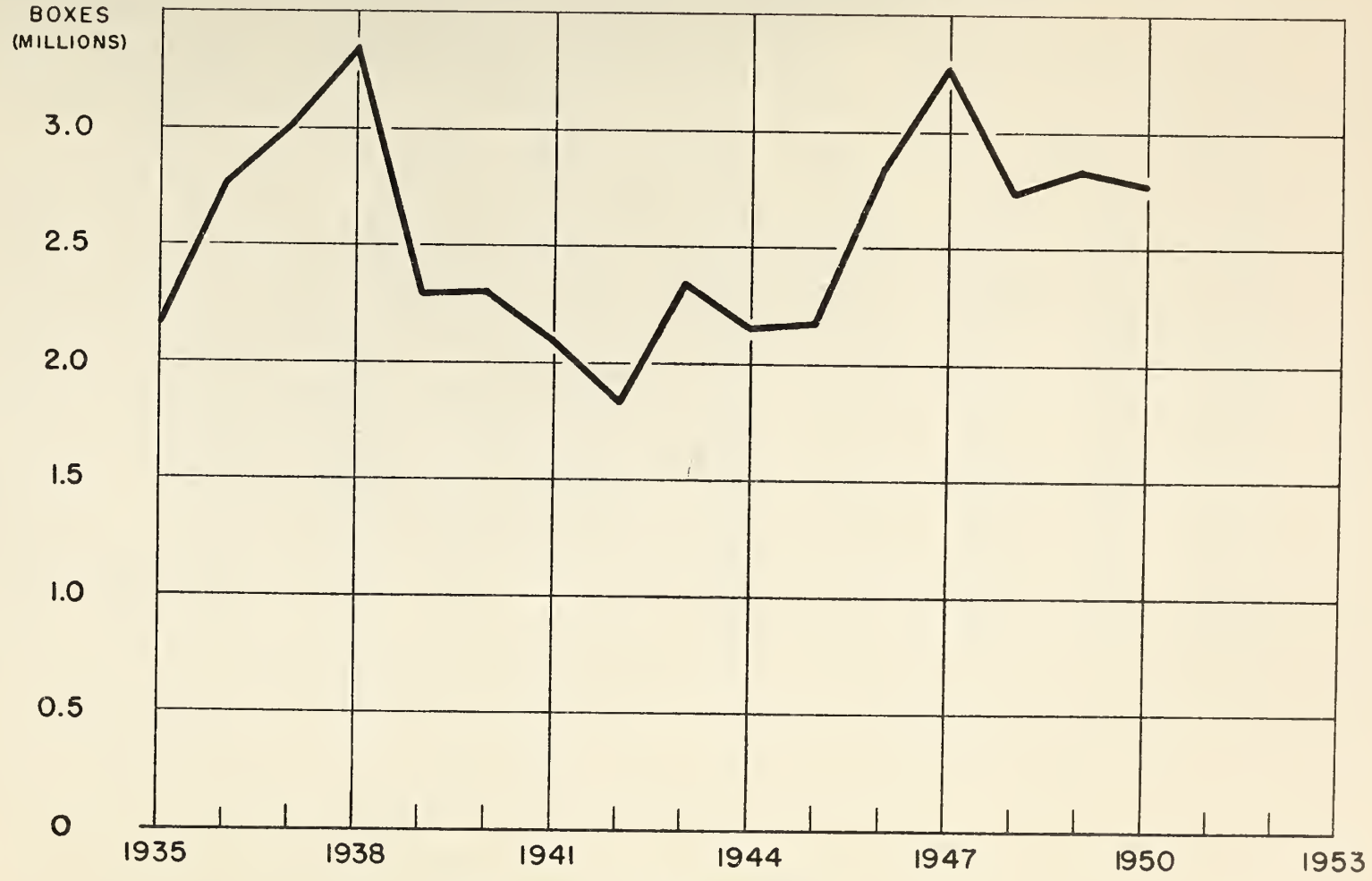
GRAPEFRUIT: PRODUCTION IN PALESTINE,* ALGERIA, MOROCCO, SURINAM, SOUTH AFRICA, CUBA, TRINIDAD, AND JAMAICA, 1935-50



*MOSTLY ISRAEL - 1948, 1949 AND 1950

Table 5.-Grapefruit: Production In Specified Countries, 1935-50

Year	Palestine	Algeria	Morocco	Surinam	South Africa	Cuba	Trinidad	Jamaica	Total
	1,000 boxes	1,000 boxes	1,000 boxes	1,000 boxes	1,000 boxes	1,000 boxes	1,000 boxes	1,000 boxes	1,000 boxes
1935	844	1/ -	1/ -	5	425	450	170	270	2,164
1936	1,534	1/ -	1/ -	10	425	425	180	193	2,767
1937	1,794	1/ -	1/ -	10	450	400	150	207	3,011
1938	2,067	1/ -	1/ -	10	546	300	150	259	3,332
1939	988	9	1/ -	10	628	300	220	137	2,292
1940	700	13	30	8	824	300	246	180	2,301
1941	550	18	33	8	846	300	144	200	2,099
1942	300	13	35	8	858	250	171	200	1,835
1943	800	11	24	13	968	160	114	250	2,340
1944	691	15	39	15	681	210	214	300	2,165
1945	800	15	42	23	636	90	260	316	2,182
1946	1,238	55	70	44	658	150	328	300	2,843
1947	1,500	26	29	16	693	130	587	290	3,271
1948	2/ 1,068	24	55	100	724	150	194	421	2,736
1949	2/ 750	29	83	70	715	170	579	436	2,832
1950	2/ 600	14	56	100	725	190	600	500	2,785

1/ Not reported.
2/ Mostly Israel.

Source: Compiled from official figures.

WESTERN EUROPEAN CITRUS IMPORTS

Orange imports of the nine European countries listed in Table 6 were slightly larger in 1949 than in 1938. This recovery in imports was not generally shared by all consuming countries. Those which had sufficient foreign exchange to make all desired purchases imported considerably larger quantities of oranges than in the prewar years. France and Switzerland each imported twice as much in 1949 as in 1938, and Belgium, Denmark, and Sweden also increased their imports. A remarkable increase was made by Western Germany, and its orange imports in 1949 were nearly as great as those of all Germany in 1938.

Countries with insufficient foreign exchange to make citrus purchases imported smaller quantities in 1949 than in 1938, and Norway and the United Kingdom reduced imports to a marked degree. This should not be interpreted as a change in the consuming habits; the desire to consume oranges is as great in these countries as in those which have been able to purchase the desired supplies. A general tendency to increase orange consumption where foreign exchange is available is indicative of a potential market and desire to consume which will make for a much larger orange market in Europe when foreign exchange is again available in all countries. If Norway and the United Kingdom could purchase all the oranges they desired, total orange imports into these nine countries would probably be nearly 45 million boxes a year, compared with approximately 33 million boxes in 1938.

Total lemon imports in 1949 were only slightly below prewar imports. Western Germany, the Netherlands, Norway, and the United Kingdom imported less in 1949 than in the prewar years, but lemon imports were fairly well maintained in most countries despite foreign exchange difficulties. Total lemon imports may be limited for some time by the reduced production in Italy.

The postwar imports of grapefruit have not been resumed on a level comparable to that of 1938. 1/ Of the nine countries listed, only Denmark imported more grapefruit in 1949 than in the prewar years. In postwar years, as governments husbanded their foreign exchange, lemons and oranges were considered as more essential than grapefruit. The long absence of this fruit from many markets caused many consumers to lose the habit of eating grapefruit, and grapefruit imports declined even in Belgium where foreign exchange was available to make desired purchases. In general, Western Europe seems to show a preference for oranges at the expense of grapefruit.

1/ This may be partly due to the shortage of sugar.

Table 6.--Citrus Fruit: Imports into Specified Countries, 1938, 1948, and 1949

Commodity and destination	1938	1948	1949
	Boxes	Boxes	Boxes
Oranges:			
Belgium	2,417,360	3,128,106	2,677,171
Denmark	316,429	131,139	551,678
France	5,778,921	7,584,178	12,386,106
Germany	2,708,403	1/ 51,887	1/ 2,671,944
Netherlands	2,383,097	1,109,985	1,454,690
Norway 2/	894,575	264,741	308,046
Sweden	1,338,186	1,394,176	1,988,675
Switzerland	720,064	1,562,925	1,496,095
United Kingdom	3/ 16,550,541	3/ 14,626,502	9,689,138
Total	33,107,576	29,853,639	33,223,543
Lemons:			
Belgium	173,877	301,479	288,629
Denmark	89,518	182,082	144,952
France	714,618	992,488	1,178,620
Germany	1,746,780	1/ 233,780	1/ 1,314,522
Netherlands	155,660	45,832	88,387
Norway 4/	-	-	-
Sweden	67,256	150,270	136,389
Switzerland	358,487	394,691	441,241
United Kingdom	1,536,864	1,335,948	954,069
Total	4,843,060	3,636,570	4,546,809
Grapefruit:			
Belgium	247,854	182,376	182,568
Denmark	18,907	0	32,088
France	130,051	41,248	51,119
Germany	87,545	1/ 83	1/ 331
Netherlands	86,270	31,746	36,651
Norway 4/	-	-	-
Sweden	61,240	46,922	52,001
Switzerland	-	-	-
United Kingdom	3/ 1,963,425	1,419,410	1,503,554
Total	2,595,292	1,721,785	1,858,312

1/ Bizone.
2/ Includes all citrus.
3/ Net.
4/ Not separately classified.

Source: Compiled from official figures.

ORANGE VARIETIES AND THEIR NORMAL EUROPEAN MARKETING SEASONS

The most important early orange variety for Germany and Switzerland is the Italian Biondo and for the rest of Europe the Spanish white or blond oranges, the Comuna and Cadenera. The Cadenera is an exceptional orange, and must be considered as one of the world's finest commercial varieties.

Most of the midseason oranges marketed in Europe are bloods or semi-bloods. The Shamouti and Ovale are exceptions.

The most important late winter orange is the Verna of Spain, an outstanding Mediterranean variety which usually leads the market in price.

Table 7 lists the more important orange varieties indicating the usual market and marketing season. The markets indicated are the more important ones in recent years, but the importance of each is subject to change in accordance with changing trade balances and trade agreements. These markets are therefore, general designations. The marketing season has also been indicated in general terms as the season differs slightly from year to year owing to climatic conditions. It should be noted that fruit from Morocco is about 2 to 3 weeks earlier than fruit from Spain, and that the Middle East producing areas are also early districts. Late varieties, such as the Valencia, from Morocco and the Middle East are marketed in competition with midseason varieties from the western Mediterranean.

The marketing season of several varieties, such as the Cadenera, Verna, and Ovale, could be longer than indicated, considering the quality of the variety; however, the Mediterranean fruit fly, which becomes active after the rainy season when temperatures rise in May and June, damages the fruit, and the marketing season is thereby limited.

The Valencia variety has an interesting place in the European market. It is available from South Africa from July through December, and in November and December the "old" South African fruit competes with the new crop of early fruit from the Mediterranean. In Morocco and the Middle East the Valencia matures early, and the small quantities sold in April and May compete with midseason bloods and semi-bloods, which are then near the end of their season. Following these "early" Valencias are the few Valencias from Spain, where this is a very minor variety.

The summer season repeats two of the winter varieties, the navel and the Valencia. The navels from Brazil and South Africa compete with the late Mediterranean oranges which are just ending their season when the navels from the Southern Hemisphere are ready for the market. The "Southern"navel season

is rather short, and by July the Valencias from South Africa and the Peras from Brazil dominate the market. The Pera ends its shipping season in September or October, but the Valencia is shipped until the first of the year.

The Pera tends to be smaller in size than the Valencia and its thin peel makes it difficult to ship. It usually sells at lower prices than the South African fruit.

From July to November the South African Valencia is the dominant variety and the excellent merchandising done by the South African Marketing Board makes it one of the most competitive of all varieties sold in the European market.

Table 7.-Orange Varieties: Their Normal European Marketing Season and Markets, by Source (excl. U. S.)

Variety	Source	Marketing season	Type of orange	Usual market	Comment
Winter Season, October through May					
Clementine	Morocco *	Oct.15-Jan.	Orange-tangerine hybrid, the earliest variety	France *	A small, light-colored, fine flavored fruit usually selling at the highest prices
	Algeria *	Nov. - Feb.		U. K. *	
	Spain	Nov. - Feb.		Germany	
				Belgium	
				Switzerland	
Navel	Moroceo	Nov. - Feb.	Medium peel, nonblood, an early variety	France *	A fine fruit, medium-to-large size, good color
	Spain *	Nov.15-Feb.		Switzerland*	
	Algeria	Nov.15-Feb.		U. K.	
				Belgium *	
				Sweden	
				Germany	
Comuna	Spain *	Nov.-April	Seeded, medium peel, nonblood, an early variety (a group)	U. K. *	A medium-sized fine, sweet fruit of good color
	Morocco	Nov.-April		France *	
				Germany *	
				Belgium *	
				Netherlands	
				Norway	
				Sweden	
				Denmark	
				Switzerland	

(Continued)

Table 7.-Orange Varieties: Their Normal European Marketing Season and Markets, by Source (excl. U. S.) (Continued)

Variety	Source	Marketing season	Type of orange	Usual market	Comment
Winter Season, October through May					
Cadenera..	Spain * Morocco Algeria	Nov. - May Nov. - May Nov. - May	Seedless, medium peel, nonblood an early variety	U. K. * France * Belgium * Germany * Netherlands Switzerland Norway Sweden Denmark	The finest early nonblood fruit on European markets. Outsells all competition including navels from U.S.
Biondo....	Italy *	Nov. - Jan.	Seeded nonblood a "flat"-shaped fruit like a tangerine in contour, an early variety	Germany * Switzerland* Denmark Norway	Italy's early orange, mostly shipped in bulk
Ovale.....	Italy *	March-June	Nonblood, few seeds, a mid-season variety	Germany * Switzerland* Sweden Denmark Belgium	Italy's best non-blood, shipped mostly in bulk
Shamouti (Jaffa).	Israel * Cyprus * Lebanon *	Nov.-June	Nonblood oval, thick peel, few seeds, a mid-season variety	U. K. * France Netherlands * Sweden * Denmark * Czechoslo-vakia * Belgium Poland	The midseason orange of the Middle East, a good quality, large-sized fruit
Maltaise..	Algeria * Morocco * Tunisia *	Jan. - May	Nonblood oval, medium peel, few seeds, a mid-season variety	France * Germany	The mid-season nonblood of North Africa, of medium size

(Continued)

Table 7.-Orange Varieties: Their Normal European Marketing Season and Markets, by Source (excl. U. S.) (Continued)

Variety	Source	Marketing season	Type of orange	Usual market	Comment
			Winter Season, October through May		
Portugaise	Algeria * Morocco *	Feb.-May	Semi-blood oval, medium peel, few seeds, a mid-season variety	France * Germany	A popular semi-blood variety in North Africa
Doble fina (blood oval)	Spain * North Africa	Jan. - June	An oval blood, medium peel, a mid-season variety	Belgium* France * Sweden Germany Switzerland	A fine blood orange, one of the best known in Europe
Sanguinello...	Italy * Spain	Jan. - March	Blood orange with pigment in juice, a mid-season variety	Germany * Switzerland* Sweden * France Denmark Belgium Netherlands	A fine blood orange, one of the best known Italian varieties
Tarocco...	Italy *	Dec.15-Feb.	Blood orange with pigment in juice a mid-season variety	Switzerland* Germany * Sweden Belgium	A very fine blood orange not in large supply as yet
Verna (berna)..	Spain * Morocco	April-June	Nonblood late variety	Belgium * France * Sweden Netherlands* U. K. * Switzerland*	A very fine late orange. The major late orange of Spain. Usually leads the market in price. A medium-sized fruit.

(Continued)

Table 7.-Orange Varieties: Their Normal European Marketing Season and Markets, by Source (excl. U.S.) (Continued)

Variety	Source	Marketing season	Type of orange	Usual market	Comment
Winter Season, October through May					
Valencia..	South Africa * Israel Morocco Cyprus Spain(very minor)	To Dec. 30 Mar. - May Mar. - May	Nonblood, a late variety shipped in the winter season from these producing areas	U. K. * Norway Sweden * Belgium * Switzerland* Germany	South Africa is the only major supplier (excl. U.S.) of the Valencia for the European market. It is not raised in quantity in the Mediterrancan
Summer Season, June through September					
Navel.....	Brazil South Africa *	May-July	Medium peel, nonblood, an early variety	U. K. * France * Sweden * Belgium * Switzerland	Brazilian fruit tends to run to large sizes; both sources produce fine fruit
Valencia..	South Africa *	July-Dec.	Medium peel, nonblood, a late variety	U. K. * Sweden Switzerland Belgium Germany	A fine fruit of excellent grade and quality. It tends to be somewhat less juicy than the same variety produced in some Calif. districts
Pera 1/...	Brazil *	July - Nov.	Thin peel, seeded nonblood a late variety	U. K. * Sweden Belgium * Switzerland France	A juice fruit, difficult to peel, tends to run to small sizes, has light-colored flesh

* Major source or market.

1/ May be a group of varieties. There is considerable difference in the fruit sold under this name.

COMMERCIAL CITRUS SIZES IN INTERNATIONAL TRADE

European markets have definite size preferences in citrus. They prefer grapefruit of a smaller size than the United States market, and most grapefruit from sources other than the United States is smaller than the normal run of fruit from Texas and Florida. Medium-sized oranges are preferred, and those sold on the European markets average about the size of most United States fruit, except the Shamouti orange which is larger. Lemons sold on European markets tend to be somewhat larger than fruit sold in the United States. This is particularly true of Spanish lemons.

The sizes in which citrus fruits are packed vary considerably from one country to another. In order that some comparison can be made of these size factors, a tabulation has been prepared for oranges, lemons, tangerines, and clementines, and grapefruit (See Tables 8-11). The size designation for each count of fruit sold in each individual country has been translated in terms of diameters to the nearest one-sixteenth of an inch.

In most countries engaging in international trade in citrus, the sizes are expressed in count per box. In Algeria and Tunisia, however, the sizes are expressed in terms of "export numbers," and in Morocco they are expressed in "export numbers" and also in terms of the count per box.

Wherever possible the average diameter of the fruit count has been used, but this could not be done in all cases since some countries designate their export sizes in terms of minimum diameters. Because of this variation and because a "rounded" figure had to be used to convert the diameter to one-sixteenth of an inch, the size designations are not exactly comparable; however, they are near enough to make for reasonable comparison between sizes. It is hoped that this will facilitate a comparison of the prices quoted on foreign fruit in terms of foreign sizes with the prices quoted on United States fruit.

In utilizing these tabulations it should be remembered that they are approximate both for the foreign diameters and for the domestic comparison.

Table 8.--Oranges: Size of Fruit and Number per Box as Sold on European Markets, 1950, Compared with U. S. Sizes and Numbers

Size (approx. average diameter) Inches	Calif.	Florida	South Africa	Brazil	Spain	Palestine	Morocco 1/		Algeria	Tunisia
	No. per box	No. per box	No. per box	No. per box	No. per box	No. per box	No. per box	Size designation	Size designation	Size designation
4-4/16									00	
4-3/16										
4-2/16										
4-1/16										
4										
3-15/16										
3-14/16									0	
3-13/16					80					
3-12/16						120				
3-11/16										
3-10/16		96					1	80	1	
3-9/16	100									
3-8/16			80		96					5X
3-7/16		126								
3-6/16	126		96			150	2	96	2	4X
3-5/16										
3-4/16			112		112		3	112		
3-3/16	150	150								3X
3-2/16			126	126	126		4	126	3	2X
3-1/16		176		150						
3	176		150	176	150	180	4	150		
2-15/16		200								
2-14/16			176		176		5	176	4	X
2-13/16	200	216		200						
2-12/16			200		200	210				
2-11/16		250		216			6	200	5	0
2-10/16				226	216		7	216		1
2-9/16	220	288	226				8	224		
2-8/16	252		252		252	240	9	252	6	
2-7/16	288	324								
2-6/16			288	252	288		10	288		2
2-5/16				288					7	
2-4/16	344		324		324	294	11	324		
2-3/16				324						
2-2/16										
2-1/16										
2			360			336				

1/ Minimum diameter.

Source: Compiled from official sources.

Table 9.-Lemons: Size of Fruit and Number Per Box as Sold on European Markets, 1950, Compared with U.S. Sizes and Numbers

Size (approx. average diameter)	California	Brazil	South Africa	Morocco 1/		Algeria	Tunisia
Inches	No. per box	No. per box	Size designation	Size designation	No. per box	Size designation	Size designation
3-2/16			Large			1	
3-1/16			Large				
3			Large				
2-15/16			Large				
2-14/16			Large			2	
2-13/16			Large				
2-12/16			Large	1	140		
2-11/16			Large			3	0
2-10/16		210	Large				1
2-9/16			Large	2	160		
2-8/16	210	250	Medium			4	
2-7/16	252		Medium				
2-6/16		270	Medium	3	210		2
2-5/16			Medium			5	
2-4/16	300		Medium				
2-3/16		300	Medium	4	292		3
2-2/16	360	360	Medium			6	
2-1/16			Small				
2	432	420	Small			7	4
1-15/16			Small	5	344		
1-14/16			Small				5
1-13/16	490	490	Small			8	
1-12/16			Small				
1-11/16	588	540	Small			9	
1-10/16			Small				

1/ Minimum diameter.

Source: Compiled from official sources.

Table 10.-Tangerines and Clementines: Size of Fruit and Number Per Box as Sold on European Markets, 1950, Compared with U.S. Sizes and Numbers

Size (approx. average diameter)	Florida	Brazil	Morocco 1/				Algeria		Tunisia
			Clementines		Tangerines		Clementines & satsumas	Tangerines	
Inches	No. per box	No. per box	Size designation	No. per box	Size designation	No. per box	Size designation	Size designation	Size designation
3-8/16...									
3-7/16...									
3-6/16...									
3-5/16...		60							
3-4/16...									
3-3/16...									
3-2/16...									
3-1/16...		76							5X
3.....		90							4X
2-15/16..	100								
2-14/16..							1	1	
2-13/16..									3X
2-12/16..			1	42	1	42			
2-11/16..	120	106					2	2	2X
2-10/16..					1	48			
2-9/16...			1	48	2	48			
2-8/16...	150		2	54	3	54	3	3	X
2-7/16...									
2-6/16...	176	120	3	75	4	75			0
2-5/16...							4	4	1
2-4/16...	210		4	90	5	90			
2-3/16...		144							
2-2/16...	246						5	5	2
2-1/16...			5	105					
2.....	294	168							3
1-15/16..			6	132			6	6	
1-14/16..		216							
1-13/16..			7	135			7	7	4
1-12/16..									
1-11/16..							8	8	
1-10/16..									
1-9/16...							9		
1-8/16...									
1-7/16...							10		
1-6/16...									

1/ Minimum diameter.

Source: Compiled from official sources.

Table 11.-Grapefruit: Size of Fruit and Number Per Box as Sold on European Markets, 1950, Compared with U.S. Sizes and Numbers

Size (approx. average diameter)	Florida	Brazil	South Africa	Palestine (Israel)	Morocco 1/		Algeria	Tunisia
Inches	No. per box	No. per box	No. per box	No. per box	Size designation	No. per box	Size designation	Size designation
5-5/16	36							
5-4/16					1	28		
5-3/16		28						
5-2/16								
5-1/16							00	
5	46	36						
4-15/16							0	
4-14/16								
4-13/16		46						
4-12/16					2	36		
4-11/16	54							
4-10/16								
4-9/16							1	
4-8/16	64	54			3	46		
4-7/16								
4-6/16			46	80				
4-5/16	70	64						5X
4-4/16							2	
4-3/16					4	54		
4-2/16		72	54					4X
4-1/16	80							
4		80		96	5	64		
3-15/16			64					
3-14/16	96				6	70	3	
3-13/16			70					2-3X
3-12/16				112				
3-11/16	112							
3-10/16	126		80	126	7	80	4	
3-9/16								
3-8/16								
3-7/16			96	150				
3-6/16					8	96	5	X
3-5/16		96	112					
3-4/16					9	112		
3-3/16		112						1
3-2/16		126	126		10	126	6	
3-1/16								
3			150		11	150		

1/ Minimum diameter.

Source: Compiled from official sources.

CITRUS PRICES AT THE ANTWERP AUCTIONS

The world's most cosmopolitan citrus market is located at Antwerp, Belgium, where a citrus auction is operated by four participating firms. In that market, all of the citrus which is important in international trade meets in competition. In winter may be found oranges from California, Texas, Spain, Cyprus, Israel, Mexico, and Italy 1/; in summer there are oranges from California, Brazil, and South Africa.

The citrus fruits are sold either through auction or private treaty. The auction sales, which are held twice a week, usually on Tuesday and Thursday, normally dispose of the largest volume of fruit. In prewar years, buyers from many nearby countries also obtained their fruit in this market, and at present fruits are purchased for Switzerland and Western Germany.

At each auction, catalogs are available listing the fruit to be sold by lots, giving size, number of boxes in each size, and variety and source. After the sales these catalogs are priced, and, through the courtesy of three auction firms, the United States Department of Agriculture has been receiving these priced catalogs in Washington. From these catalogs an analysis has been made of the auction prices from November 1948 to March 1951. In selecting the prices, a modal average has been obtained by inspection.

In order to compare the various fruits offered for sale, tabulations have been made of one size each of winter oranges, summer oranges, grapefruit, and lemons (see Tables 12-15). The auction prices are given in Belgian francs. Since the Belgian franc is worth about 2 U. S. cents at the present rate of exchange, the approximate price in U. S. cents may be obtained by multiplying the price in francs by 2.

Winter Oranges

Size 252 has been used in the price comparison for winter oranges since this is usually a central tendency in the range of sizes and is quite representative of the average price. Only one auction per week is shown, and the data will therefore show trends.

The tabulation covers three periods (November 22, 1948, to May 30, 1949; November 24, 1949, to May 30, 1950; and November 7, 1950, to March 15, 1951) and clearly shows the seasons when United States citrus must compete with

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1/ Italian oranges are not included in the tabulation of prices, since they are usually sold in bulk or in packages other than boxes.

fruit from other sources. The season for Spanish oranges is opened in November by shipments of navels. By December 1 there are shipments of what are known as blond or white oranges: the Cadenera, a seedless non-blood orange, and the Comuna, a seeded nonblood orange. By late January and early February the Spanish blood ovals begin to reach the market, bringing at first a premium price over the nonblood oranges. The Shamouti oranges from Israel are sold at approximately the same season as the Spanish blood oval. The oranges from Mexico introduced into the market at the end of 1949 and in early 1950 are of approximately the same season as the Spanish white oranges and the Spanish navel.

Although only small samples were available from Florida and Texas, it will be noted from the sales made that the California oranges generally brought higher prices. This is probably due to the character of the fruit, since the Florida and Texas orange tends to be thin-skinned and is not so easily eaten out of hand as is the California orange. The California orange is more like the fruit to which the Europeans are accustomed.

Comparing United States citrus with the Spanish varieties, it will be noted that the average price brought by the blood oval and Sanguinelli was higher than the average price of United States citrus. In May 1949, the Spanish late nonblood orange, the Verna (Berna), outsold both the blood oval and the California navel. At the time these high prices of over $8.00 a box were paid at Antwerp, the Vernas were being sold in volume.

It will also be noted that the average prices of Mexican and Shamouti oranges were lower than the average price of United States citrus. However, in February and March 1951, Israel Shamoutis brought higher prices than California navels.

In January 1950 the Spanish navel outsold the California navel by about $1.50 per box. During January and February the Spanish Cadenera was in the market in volume, and the prices for this fruit were generally higher than the price for the California navel. The Spanish blood orange (the Sanguinelli) shown during February and March 1950 provides an interesting but not altogether fair comparison since this fruit was not sold in volume at the high prices indicated.

On the average, Spanish oranges sold at higher prices than California oranges in the winter season. The United States has never exported large quantities of oranges to Europe during this season because of the large supplies of fruit from the Mediterranean area which can be made available on the European market at prices below those profitable to United States growers who must pay high ocean freight.

Another fact which is clearly shown by these data is that, regardless of volume, the better-quality Spanish oranges such as the Cadenera, Verna, Doble Fina, and Sanguinelli outsell United States fruits on a quality basis. This is true of both blood and nonblood types.

This is a challenge to the United States citrus industry, which could improve its competitive position in Europe in winter by producing fruit equal or superior to that available from other sources.

The European preference for non-United States fruit may be of interest as an indication of possibilities of improving United States fruit by the adoption of some of the high-quality foreign varieties.

Summer Oranges

For the price comparison of summer oranges, size 288 was chosen because of the recent small sizes of California oranges. If size 252 had been chosen, the price would not have been representative since this size would have been the top of the range of sizes offered for sale in 1948-49 by California shippers.

The principal fruits in the summer market are the California Valencia, South African Valencia, and Brazilian Pera. The prices obtained for California Valencias, which were in the market from September 13, 1948, until the end of that season's tabulation on November 25, 1948, and from May 10, 1949, until the end of October 1949, were better on the whole than the prices obtained for Brazilian Peras. The condition of the fruit on arrival is certainly a factor in this price consideration, for in recent years Brazil has experienced difficulty with stem-end rot in its export shipments. Brazilian fruit arriving in Europe in 1949 was found to decay rather rapidly after removal from refrigerated ship. This decay usually started about the third day after the fruit had been subjected to normal temperatures.

There is not a great deal of difference between California and South African Valencias in this size; one sale will be higher for South African fruit and the next sale higher for California fruit. The South African Valencias reaching the market were larger than those from California, and, therefore, the comparison by price in this size may not be entirely representative.

Grapefruit

In comparing grapefruit, size 112 was chosen, since European markets usually prefer smaller sizes than the United States markets. The period of tabulation is from October 7 to the end of November 1948, and from January 1949, to March 1951.

Auction prices are shown for Texas white and pink grapefruit, Florida grapefruit, California grapefruit, and grapefruit from Arizona, Brazil, Israel, and the Dominican Republic.

First, in comparing the prices of white and pink grapefruit, it will be noted that in November 1948 and in January and February 1949 the pink grapefruit generally brought 40 to 50 cents more than the white grapefruit. The Texas shipments stopped on March 7, 1949, because of the destruction of fruit by the severe cold weather in Texas in January 1949.

Comparing Florida and Texas grapefruit, it will be noted that when both are in the market at the same time there is little to choose between the two. However, comparing California grapefruit with either of the two, the high preference for the Florida and Texas grapefruit will be seen, and price differentials between California grapefruit and Florida and Texas grapefruit, will average from 50 cents to $1.00 per box.

The prices for the few sales of Brazilian grapefruit were even lower than for the California fruit, prices of less than $4.00 a box being obtained in July and August of 1949.

During February and March when some Israel grapefruit was sold at about the same time as Texas white grapefruit, preference was given to the Texas grapefruit, the differential in price being over 50 cents per box.

Grapefruit from the Dominican Republic sold at a good price when no other grapefruit was in the market; however, when other grapefruit was in supply, the price was about equal to that of Israel fruit and generally lower than the price of Texas grapefruit in the market at the same time.

Lemons

Italian lemons dominate all Western European markets. The Italian lemon is primarily a winter fruit and is sold in volume from November through May. In the summer, from May through October, supplies are only a fraction of the winter season. Because of this fluctuation in supply there is a great difference in the seasonal lemon prices. The auctions indicate that when lemons are in short supply in August and September the wholesale prices are nearly double those of the winter season. It is during this season of high prices that lemons are received in the Belgian market from non-Italian sources. This was particularly noticeable from June through September 1950, when very few Italian lemons were available. During this period lemons were imported from Spain, South Africa, Chile, and California.

Lemons from South Africa and Spain tend to run to large sizes. Large lemons can be sold on this market, but the price per box is lower on the average than for lemons in the 300 count packed in a normal weight box.

When lemons from California and Italy are in the market at the same time, prices are fairly comparable on a box basis, but the Italian lemon is usually cheaper on a pound basis since the Italian 300 "large" size box weighs nearly 19 pounds more than the California 300 size box. California lemons are most likely to find a satisfactory market in Europe from July through September when Italian lemon supplies are lowest.

Table 12.--Winter Oranges: Price per Box, Size 252, Antwerp Auctions, 1948-49, 1949-50, and 1950-51, by weeks 1/

(Prices in Belgian francs)

Date of auction	Calif. navels	Florida (unspec.)	Texas (unspec.)	Spanish navel	Spanish Cadenera 2/	Spanish Comuna 2/	Sp. blood oval Doble fina	Sp. San-guinelli 3/	Spanish Verna	Cyprus Shamouti	Israel Shamouti 4/	Mexico (unspec.)
	77-84 lb. box	90-93 lb. box	88-93 lb. box	82-86 lb. box	82-86 lb. box	82-86 lb. box	82-86 lb. box	82-86 lb. box	82-86 lb. box	75-84 lb. box	97-106 lb. box	77-86 lb. box
Nov. 22, 1948	460											
Nov. 25, 1948										442		
Jan. 6, 1949	355		270	332	367	355	380					
Jan. 17, 1949	344									230		
Jan. 24, 1949	320				485		392					
Jan. 31, 1949	350		295				327					
Feb. 7, 1949	320						330					
Feb. 14, 1949							335					
Feb. 21, 1949	327	275	300			352	362					
Feb. 28, 1949						335						
March 7, 1949						292	330			160		
March 14, 1949	295					295	332					
March 21, 1949	297						290					
March 28, 1949		260				337	335					
April 4, 1949	297						380					
April 12, 1949	320	250					337					
April 19, 1949	345						335					
April 25, 1949	317						325					
May 3, 1949	335						325		400			
May 10, 1949	352						340		400			
May 17, 1949	425						425		450			
May 23, 1949									410			
May 30, 1949									392			
Nov. 24, 1949				285	260	242						
Nov. 28, 1949				-	-	-						200
Dec. 1, 1949				280	265	265						
Dec. 5, 1949												
Dec. 12, 1949				290	275	260						240
Dec. 19, 1949	250			272	270	255						
Dec. 27, 1949				300	300	260						282
Jan. 3, 1950	312			310	310							
Jan. 9, 1950												
Jan. 12, 1950					335	342						
Jan. 19, 1950	332			415	355	340	415					
Jan. 26, 1950	280			350	320	280	325					270
Feb. 2, 1950	272			350	342	295	325	380			337	
Feb. 9, 1950	275				325	300	305	380				267
Feb. 14, 1950					270	280	270	400				
Feb. 23, 1950	267						280	395			240	
Feb. 28, 1950					340		297	425				
March 6, 1950							295	440			275	
March 13, 1950	260						290	425			300	
March 20, 1950	315						300	440			302	
March 27, 1950	330						335	-			-	
April 3, 1950	330						375	480			250	
April 11, 1950	302						340	-			202	
April 17, 1950	325						377		390			
April 24, 1950							370		380			
May 2, 1950	410						415		420			
May 9, 1950							485		500			
May 15, 1950							400		425			422
May 22, 1950												
May 30, 1950												
Nov. 7, 1950												
Nov. 14, 1950				412	412							
Nov. 23, 1950				315	315	275						
Dec. 5, 1950				250	270							200
Dec. 12, 1950				205	222							
Dec. 28, 1950				260	260	245						
Jan. 4, 1951				265	262	240						
Jan. 11, 1951				312	305	280						
Jan. 16, 1951				300	267	247						
Jan. 23, 1951				275	275	245	300					
Jan. 30, 1951	270				275	245	282	435				
Feb. 5, 1951	250				285	250	265	385				195
Feb. 8, 1951	260				285	250	272	380				
Feb. 13, 1951	262			300	300	277	285	407			305	
Feb. 20, 1951	-				300	275	277	400				
Feb. 26, 1951	265				295	265	265	360			305	
March 1, 1951	285				315	260	275	375				
March 6, 1951	302					280	305	380			332	
March 15, 1951	285						307	370				

1/ Compiled from priced catalogs of the firms of B. M. Spiers, Leon Van Parys and Gerard Koninckx, Freres, Antwerp. Quotations are modal prices for size 252 which are not exactly comparable for all countries but are close enough for valid comparison. When no quotations for size 252 were available, quotations for the nearest size were used. Quotations for Israel Shamoutis are for size 240.

2/ In 1948-49 few Cadenera and Comunas were sold at auction in Antwerp because the British Ministry of Food purchased large quantities of these Spanish varieties under contract.

3/ Sanguinellis are sold in small volume as compared to other Spanish varieties.

4/ Size 240.

Table 13.-Summer Oranges: Price per Box, Size 288, Antwerp Auctions, 1948-49, 1949-50, and 1950-51, by Weeks 1/

(Prices in Belgian francs)

Date of auction	California Valencia	South Africa		Brazil	Texas	Florida	Spain		
		Valencia	Navel	Pera	Unspec.	Unspec.	Verna	Blood oval Doble fina	Valencia late
	73-82 lb. box	77-84 lb. box	77-82 lb. box	88-97 lb. box	88-93 lb. box	90-99 lb. box	82-86 lb. box	82-86 lb. box	82-86 lb. box
Sept. 13, 1948	305								
Sept. 20, 1948	295								
Sept. 30, 1948	310								
Oct. 7, 1948	290								
Oct. 14, 1948	335			317					
Oct. 21, 1948	375			310					
Nov. 2, 1948				340					
Nov. 9, 1948				325	307				
Nov. 15, 1948						340			
Nov. 22, 1948	430					345			
Nov. 25, 1948					370				
May 10, 1949	355						405	340	
May 17, 1949	415						440	410	
May 23, 1949	405						410		
May 30, 1949	387						395		
June 7, 1949	377		400						
June 14, 1949	412								
June 20, 1949									
June 27, 1949	410								
July 4, 1949	420								
July 11, 1949	325			302					
July 18, 1949	310								
July 25, 1949			320						
August 1, 1949	302								
August 8, 1949	315			240					
August 16, 1949				202					
August 22, 1949	292	302							
August 29, 1949	235			190					
Sept. 5, 1949	200	290		165					
Sept. 12, 1949	315	287							
Sept. 19, 1949	252	260							
Oct. 2, 1949	267	300		235					
Oct. 10, 1949	280								
Oct. 17, 1949	232								
Oct. 24, 1949	240	220							
Nov. 3, 1949		345							
Nov. 14, 1949		322							
Nov. 28, 1949		210							
Dec. 5, 1949		230							
May 2, 1950			372				420	415	400
May 9, 1950							500	485	
May 15, 1950	337		345				425	400	
May 22, 1950	367						-	-	
May 30, 1950	350						-	-	
June 5, 1950	375		352						
June 12, 1950	500		445						
June 20, 1950	385								
June 27, 1950	320								
July 4, 1950	270		227						
July 11, 1950	275								
July 18, 1950	325								
July 25, 1950	310								
August 1, 1950	322								
August 10, 1950	272	257	270	225					
August 17, 1950	360								
August 24, 1950	212								
August 31, 1950	215								
Sept. 7, 1950	165	200							
Sept. 14, 1950	180	230							
Sept. 21, 1950	215	230							
Oct. 2, 1950	257	232							
Oct. 9, 1950	260	275							
Oct. 16, 1950	290	305	2/ 282						
Oct. 23, 1950	350	320							
Oct. 30, 1950	377	305							
Nov. 7, 1950		360							
Nov. 14, 1950		382							
Nov. 23, 1950		342							
Dec. 5, 1950		200							
Dec. 12, 1950		-							
Dec. 28, 1950		-							

1/ Compiled from priced catalogs of B. M. Spiers, Leon Van Parys, and Gerard Koninckx Freres, Antwerp. Quotations are modal prices for size 288 which are not exactly comparable for all countries but are close enough for valid comparison. When no quotations for size 288 were available, quotations for the nearest size were used.

2/ Probably stored fruit.

Table 14.-Grapefruit: Price per Box, Size 112, Antwerp Auctions, Oct. 1948-March 1951, by Weeks 1/
(Prices in Belgian francs)

Date of auction	Texas		Florida	California	Arizona	Brazil	Israel	Dominican Republic
	White	Pink						
	80 lb. box	80 lb. box	80 lb. box	68 lb. box	65 lb. box	75-79 lb. box	94-106 lb. box	71-82 lb. box
Dec. 7, 1948				285				
Oct. 21, 1948			347					
Nov. 2, 1948			297					
Nov. 9, 1948	275	267	282					
Nov. 15, 1948	280		250					
Nov. 22, 1948			222					
Nov. 25, 1948	205	260		150				
Jan. 6, 1949	155	232						
Jan. 17, 1949	227	280						
Jan. 31, 1949	265	300						
Feb. 7, 1949	275							
Feb. 14, 1949	260	282						
Feb. 21, 1949		305						
Feb. 28, 1949	327	340						
March 7, 1949	350	357	350					
March 14, 1949								
March 21, 1949			385					
March 28, 1949			357					
April 4, 1949			332	272	270			
April 12, 1949			325		282			
April 19, 1949			335					
April 25, 1949			340					
May 3, 1949			355	312				
May 10, 1949			395	390				
May 17, 1949					432			
May 23, 1949					445			
May 30, 1949					437			
June 7, 1949			460	360				
June 14, 1949			345	317				
June 20, 1949				295				
June 27, 1949				290				
July 4, 1949				265		200		
July 11, 1949				200		180		
July 18, 1949				220				
July 25, 1949				240				
August 1, 1949				297				
August 8, 1949				290				
August 16, 1949						230		
August 22, 1949				250		197		
August 29, 1949				175				
Sept. 5, 1949				132				
Sept. 12, 1949				187				
Sept. 19, 1949				185				
Oct. 3, 1949				180				
Oct. 10, 1949				200				
Oct. 17, 1949								
Oct. 24, 1949								
Nov. 14, 1949								350
Nov. 28, 1949	305	342		200				
Dec. 1, 1949	320							
Dec. 5, 1949	305							
Dec. 12, 1949	260							
Dec. 19, 1949	230							
Dec. 27, 1949	280							
Jan. 3, 1950	285							
Jan. 9, 1950	285							
Jan. 12, 1950	285							
Jan. 19, 1950								
Jan. 26, 1950	315							265
Feb. 2, 1950							265	250
Feb. 9, 1950	310						270	
Feb. 14, 1950								
Feb. 23, 1950	345							
Feb. 28, 1950	355							

(Continued)

Table 14.-Grapefruit: Price per Box, Size 112, Antwerp Auction, Oct. 1948-March 1951, by Weeks 1/ (Continued)

(Prices in Belgian francs)

Date of auction	Texas		Florida	California	Arizona	Brazil	Israel	Dominican Republic
	White	Pink						
	80 lb. box	80 lb. box	80 lb. box	68 lb. box	65 lb. box	75-79 lb. box	94-106 lb. box	71-82 lb. box
March 6, 1950							340	
March 13, 1950							320	
March 20, 1950							342	
March 27, 1950							350	
April 3, 1950							340	
April 11, 1950							255	
April 17, 1950							280	
April 24, 1950							280	
May 2, 1950							270	
May 9, 1950							-	
May 15, 1950							355	
May 22, 1950							390	
May 30, 1950							390	
June 5, 1950								
June 12, 1950				470				
June 20, 1950							525	
June 27, 1950				490				
July 4, 1950			422	380				
July 11, 1950			2/ 300	392				
July 18, 1950			2/ 275	405				
July 25, 1950				455				
August 1, 1950				477				
August 10, 1950				485				
August 17, 1950								
August 24, 1950				270				
August 31, 1950				155				
Sept. 7, 1950				130				
Sept. 14, 1950				135				
Sept. 21, 1950				182				
Oct. 2, 1950				190				
Oct. 9, 1950				280				
Oct. 16, 1950				240				
Oct. 23, 1950				240				
Oct. 30, 1950			292	190				
Nov. 7, 1950			335					
Nov. 14, 1950			347					
Nov. 23, 1950			320					
Dec. 5, 1950	3/ 310							
Dec. 12, 1950	3/ 170							
Dec. 28, 1950	3/ 162							
Jan. 4, 1951	3/ 155							
Jan. 11, 1951	3/ 172							
Jan. 16, 1951	190	262						
Jan. 23, 1951	212	290						
Jan. 30, 1951	215	307						
Feb. 5, 1951	245							
Feb. 8, 1951	275							
Feb. 13, 1951	307						315	
Feb. 20, 1951	-							
Feb. 26, 1951	337						342	
March 1, 1951	360							
March 6, 1951							357	
March 15, 1951							332	

1/ Compiled from priced catalogs of B. M. Spiers, Leon Van Parys, and Gerard Kominckx Freres, Antwerp. Quotations are modal prices for size 112 which are not exactly comparable for all countries but are close enough for valid comparison. When no quotations for size 112 were available, quotations for the nearest size were used.

2/ Large size 80.

3/ Large size 96.

Table 15.-Lemons: Price per Box, Indicated Sizes, Antwerp Auctions, Sept. 1948-March 1951, by Weeks 1/

(Prices in Belgian francs)

Date of auction	Italy (Prima) 2/					Spain 2/							California 2/				South Africa 2/				Chile 2/		
	97 lb. box	82 lb. box	99 lb. box	84 lb. box	84 lb. box	73-77 lb. box							79-86 lb. box				71-77 lb. box				77-82 lb. box		
	240 lg1	240	300 lg1	300	360	126	150	176	200	216	252	288	210	300	360	432	210	240	270	300	270	300	330
Sept. 13, 1948	285	252	265		215		115	160	180	187													
Sept. 20, 1948					100	160	170	190	280	300	300	265											
Sept. 30, 1948	352		252	290	150																		
Oct. 7, 1948			375	310																			
Oct. 14, 1948	310		360	287	200																		
Oct. 21, 1948	317		350	270	215																		
Nov. 2, 1948			347	260	242																		
Nov. 9, 1948			350	287	237	185	185		227	245	262	260											
Nov. 15, 1948	300	260	335	275	225			222	222	222	240	237											
Nov. 22, 1948	300	255	395	285	257																		
Nov. 25, 1948			357	280	247																		
Jan. 6, 1949			350	270	255																		
Jan. 17, 1949			375	325	300																		
Jan. 24, 1949	265		290	232	225																		
Jan. 31, 1949	210		230	220	202																		
Feb. 7, 1949	210	215	230	200	197																		
Feb. 14, 1949			222	205	187		117	125	150	157													
Feb. 21, 1949	200	190	230	210	190		122	135		160													
Feb. 28, 1949	190		220	200	175																		
March 7, 1949	185		210	177	162																		
March 14, 1949	197		217	180	170																		
March 21, 1949			220	190	160					160													
March 28, 1949			260	230	210																		
April 4, 1949			280	257	220																		
April 12, 1949	187		212	182	170																		
April 19, 1949			210	230	187																		
April 25, 1949			217	197	167																		
May 3, 1949			235	205	172																		
May 10, 1949			260	242	200																		
May 17, 1949			275	247	215																		
May 23, 1949			300	290	257																		
May 30, 1949			300	277	250																		
June 7, 1949			295	270	250																		
June 14, 1949	200		222	185	160																		
June 20, 1949			250	237	175																		
June 27, 1949	222		270	242	212																		
July 4, 1949				300																			
July 11, 1949			330	287	242																		
July 18, 1949			352		242																		
July 25, 1949			410	370	350																		
August 8, 1949		450	495	477	445																		
August 16, 1949	500		515	462	410																		
August 22, 1949		495	520	490	400																		
August 29, 1949	470		460	405	340																		
Sept. 5, 1949			470	415	365																		
Sept. 12, 1949				540																			
Sept. 19, 1949				570	530																		
Oct. 3, 1949			540	440	410																		
Oct. 10, 1949	350		420	325	310																		
Oct. 17, 1949	310		330	270	260																		
Oct. 24, 1949	355		380	320	290																		
Nov. 3, 1949	380		415	337	325																		
Nov. 14, 1949	320	285	345	290	267																		
Nov. 24, 1949	282		315	260	247																		
Nov. 28, 1949			300	250	242																		
Dec. 1, 1949			280	245	242																		
Dec. 5, 1949			260	235	240																		
Dec. 12, 1949	215		257	230	200																		
Dec. 19, 1949	217		235	212	200																		
Dec. 27, 1949			257	240																			

(Continued)

Table 15.-Lemons: Price per Box, Indicated Sizes, Antwerp Auctions, Sept. 1948-March 1951, by Weeks 1/ (Continued)

Date of auction	Italy (Prima) 2/					Spain 2/							California 2/				South Africa 2/				Chile 2/		
	97 lb. box	82 lb. box	99 lb. box	84 lb. box	84 lb. box	73-77 lb. box							79-86 lb. box				71-77 lb. box				77-82 lb. box		
	240 lg.	240	300 lg.	300	360	126	150	176	200	216	252	288	210	300	360	432	210	240	270	300	270	300	330
Jan. 3, 1950	237		262	225	212																		
Jan. 9, 1950			250	217	210																		
Jan. 16, 1950	260		257	230	215																		
Jan. 19, 1950			245	217	210																		
Jan. 26, 1950	227		260	220	207																		
Feb. 2, 1950			260	220	217																		
Feb. 9, 1950	240		257	217	210																		
Feb. 14, 1950			257	222	212																		
Feb. 23, 1950			252	222																			
Feb. 28, 1950			242	225	225																		
March 6, 1950			245	225																			
March 13, 1950	217		240	227																			
March 20, 1950			245	225	222																		
March 27, 1950			240	225	220																		
April 3, 1950			230	220	220																		
April 11, 1950			220	210	192																		
April 17, 1950			180	192	200																		
April 24, 1950			250	245	245																		
May 2, 1950			282	280	280																		
May 9, 1950			340	335	310																		
May 15, 1950			285	270	250																		
May 22, 1950			330	317	-																		
May 30, 1950			360	330	305																		
June 5, 1950			360	330	325																		
June 12, 1950	690		740	695	695																		
June 20, 1950			665	625	610		465	485		505	590	590											
June 27, 1950			465	420	370																		
July 4, 1950			615	585	520																		
July 11, 1950									450	470	505	490		630	630								
July 18, 1950			420	450	425								405	450	455	420							
July 25, 1950			555	555	555		400	450	475					525	560								
August 1, 1950							315	330				420		535	520	505							
August 10, 1950																							
August 17, 1950														560	580	505	415	470	480	475			
August 24, 1950																					440	470	470
August 31, 1950																					425		
Sept. 7, 1950				250	200												355	380	410	400			
Sept. 14, 1950																							
Sept. 21, 1950																	505	505	525	500			
Oct. 2, 1950			730	675	620																		
Oct. 9, 1950			650	515	492																		
Oct. 16, 1950	480		525	475	410																		
Oct. 23, 1950			430	370	310																		
Oct. 30, 1950			355	307	265																		
Nov. 7, 1950			377	320	300																		
Nov. 14, 1950			360	325	-																		
Nov. 23, 1950			337	300	295																		
Dec. 5, 1950			300	275	270																		
Dec. 12, 1950			305	272	262																		
Dec. 28, 1950			325	300	300																		
Jan. 4, 1951			325	300	292																		
Jan. 11, 1951			355	330	325																		
Jan. 16, 1951			347	330	330																		
Jan. 23, 1951			342	317	320																		
Jan. 30, 1951			325	300	295																		
Feb. 5, 1951			345	305	290																		
Feb. 8, 1951			340	312	292																		
Feb. 13, 1951			375	337	330																		
Feb. 20, 1951			400	375	360																		
March 1, 1951			410	382	380																		
March 6, 1951			425	390	387																		
March 15, 1951			435	385	390																		

1/ Compiled from the priced catalogs of B. M. Spiers, Leon Van Parys, and Gerard Aoninckx Freres, Antwerp. Quotations are modal prices for indicated sizes which are not exactly comparable for all countries but are close enough for valid comparisons. When no quotations for indicated sizes were available, quotations for the nearest size were used.
2/ Fancy grades have been used in all cases.

A Comparison of Prices by Sizes

Lemons. The European market accepts larger boxes and fruits than are customarily sold in the United States. For example, it will be noted from the prices shown in Table 15 for the various sizes of Italian lemons, that the 300 "large" size customarily obtains the highest price. This 300 "large" size weighs approximately 99 pounds, compared with the lower-priced 300 size, a box of which averages approximately 84 pounds. The comparative size of the fruit is indicated when the count per box is the same, 300, but there is about 15 pounds difference in the weight of the boxes. It will also be noted that the very large lemon (240 "large") is commonly sold on the Belgian auction market. A case of 240 "large" Italian lemons also weighs about 99 pounds.

Table 16.-Lemons: Prices at Antwerp Auction, by Size and Origin of Fruit, Specified Auction Dates, 1950

Size	Auction of July 25, 1950			Auction of August 17, 1950	
	Spain	Italy	California	California	South Africa
	Bel. fr. per box	Bel. fr. per box	Bel. fr. per box	Bel. fr. per box	Bel. fr. per box
140					320
150	400				
160					320
176	450				
180					365
200	475				
210					415
240					470
270					480
300 lg.		555			
300		555	525	560	475
324	480				
360		555	560	580	
432			500	505	

Source: Priced auction catalogs of B. M. Spiers, Leon Van Parys, and Gerard Koninckx Freres, Antwerp.

Table 17.-Lemons: Prices of Italian and Spanish Lemons at Antwerp Auction, by Size and Weight of Box, June 20, 1950 1/

Size	Auction of June 20, 1950			
	Spain (Berna) 2/		Italy, prima grade (verdelli) 3/	
	Weight of box	Price per box	Weight of box	Price per box
	Kilograms	Bel. francs	Kilograms	Bel. francs
150	33	465		
176	33	485		
216	33	505		
252	33	590		
288	33	590		
300			36	625
300 lg			44	665
324	33	595		
360			35	610

1/ The Belgian franc was valued at approximately 2 United States cents in 1950-51.
2/ Or Verna. A variety.
3/ Verdelli refers to a bloom not a variety.

Source: Priced auction catalogs of B. M. Spiers, Leon Van Parys, and Gerard Koninckx Freres, Antwerp.

Grapefruit. The European preference is for smaller grapefruit. In the sales of both pink and white Texas grapefruit, sizes 112 and 126 customarily brought higher prices than sizes 80 or 96. This preference for the smaller sizes is also indicated in the sale of Florida grapefruit; on the auction of July 11, 1950, size 80 brought 300 francs compared to 260 francs for size 70.

Table 18.-Grapefruit: Prices of Texas White and Pink Grapefruit at Antwerp Auction, January 23, 1951

(Prices in Belgian francs per box)

Size	Texas	
	White grapefruit	Pink grapefruit
96	210	287
112	212	290
126	212	285

Source: Priced auction catalogs of B. M. Spiers, Leon Van Parys, and Gerard Koninckx Freres, Antwerp.

Table 19.-Grapefruit: Prices of Marsh Seedless White Grapefruit at Antwerp Auction, by Size and Origin, Specified Dates

(Prices in Belgian francs per box)

Size	February 26, 1951 1/		July 11, 1950 2/	
	Texas	Israel	Florida	California
70			260	
80		300	300	
96	322	330		
100				390
112	337	342		
126	345			392
150		355		360

1/ Texas boxes weighed about 80 lb. each; Israel fruit was packed in boxes weighing 94-106 lb. each.

2/ Florida boxes weighed about 80 lb. each; California boxes weighed only about 68 lb. each. The price difference on a weight basis is greater than indicated.

Source: Priced auction catalogs of B. M. Spiers, Leon Van Parys, and Gerard Koninckx Freres, Antwerp.

Oranges. In the winter months the price-size relationship for the Spanish oranges - the blood oval, the seedless Cadenera, the seeded Comuna, the Valencia, and the Verna - is not so marked as for grapefruit. Where there is a preference, the smaller sizes usually bring a higher price than do the larger sizes of 126 and 150, but it is not unusual for all sizes in the lot to be sold for approximately the same price.

However, in other winter oranges a price-size relationship is found where the scarcity of larger fruit has put a premium on the sizes. Larger sizes (about 200 on the average) then bring higher prices than the smaller oranges.

In the summertime a more marked price relationship is found between the South African and California Valencias and the Brazil Peras. In the last few seasons California Valencias of large size were in short supply, and therefore the large sizes of Valencias on the Antwerp auction market brought a comparatively high price; however, only a very small percentage of the volume of fruit was sold at these higher prices. The same size-price relationship holds true for South African and Brazilian oranges, with the 300 count oranges bringing much lower prices than the oranges in the 200 counts.

It appears that the price differential as to size on the auction market is influenced by the supply of that size in the market. When a particular size is in short supply it brings a high price.

The price-size relationships on the Antwerp market have some relation to the manner in which Europeans customarily utilize citrus fruit. Since oranges are consumed by eating out of hand, a medium to relatively small fruit is preferred by the average Belgian consumer. It has been pointed out that in Belgium it is much more desirable to take home five medium or small oranges than to take home two large ones and divide them. Excessively large oranges, such as 80 or 100 size levels, should not be placed upon this market since they cannot be sold to advantage.

Table 20.-Winter Oranges: Prices at Antwerp Auction, by Size and Origin of Fruit, February 13, 1951

(Prices in Belgian francs per box 1/)

Size	Calif.	Spain					Israel
	Navel	Navel 2/	Cadenera	Comuna	Blood oval	Sangui-nelli 3/	Shamouti
150		300	285	245	290		270
176	262	300	300	275	290		
180							285
200	262	300	300	275	285	407	
210							305
216		300	300	277	285	407	
220	262						
240							305
252	262	300	300	277	285	407	
288	257	300	282	277	285	407	
294							307
324			282	277	282	407	
336							307

1/ Sizes are not exactly comparable. On auction date box weights were quoted as follows: California navels 79 lb.; Spanish navels 82 lb.; Cadeneras 84 lb; Blood ovals 86 lb.; Sanguinellis 84 lb; Israel Shamoutis 99 lb.

2/ One sale only.

3/ Usually sold in small volume.

Source: Priced auction catalogs of B. M. Spiers, Leon Van Parys, and Gerard Koninckx Freres, Antwerp.

Table 21.-Late Winter Oranges: Prices at Antwerp Auction, by Size and Origin of Fruit, Specified Dates 1949 and 1950

(Prices in Belgian francs per box 1/)

Size	Auction of May 15, 1950						Auction of May 10, 1949			
	Calif.	Spain		South Africa	Mexico	California		Spain	
	Valencia	Blood oval	Verna	Navel	"White"	Navel	Valencia	Blood oval	Verna
196..				310					
112..				318					
126..				327			355		
150..	300	400	410	330			355	340	412
176..	317	400	410	347	380		380	340	412
200..	325	400	410	352	405	375	385	340	412
216..		400	425	352	415			340	412
220..	325					377	385		
252..	337	400	425	360		352	362	340	400
288..	337	400	425	360	422	340	355	340	385
324..		400	425	360	422			340	385
344..	335						350		
360..			425	360					
392..	320						340		
442..									

1/ Modal averages.

Source: Priced auction catalogs of B. M. Spiers, Leon Van Parys, and Gerard Koninckx Freres, Antwerp.

Table 22.-Valencia Oranges: Prices of California and South African Valencias at Antwerp Auction, by Size, Specified Dates
(Prices in Belgian francs per box 1/)

Size	September 21, 1951		October 23, 1951		Nov. 14, 1950 2/
	California	South Africa	California	South Africa	South Africa
126	-	-	-	325	350
150	237	235	352	325	370
176	260	255	370	335	390
200	270	260	365	335	
216		260		335	392
226				335	
220	276		365		
252	255	250	365	332	390
288	245	240	350	330	377
324		230		320	
344	222		340		
360		205		275	
442		175		275	

1/ South African and Californian boxes of Valencias are about the same weight (77-86 lb. each).
2/ When California Valencias were out of the market at Antwerp, South African shipments were mostly large-size fruit with few 288's and no smaller sizes.

Source: Priced auction catalogs of B. M. Spiers, Leon Van Parys, and Gerard Koninckx Freres, Antwerp.

Table 23.-California Oranges: Prices at Antwerp Auction, by Size and Variety, May 22, 1950
(Prices in Belgian francs per box 1/)

Size	California			
	Valencias	"Mediterranean Sweets"	"Saint Mikes"	"Ruby Reds"
126		340		
150	340	355	365	360
176	357	370	365	360
200	380	380	365	380
220	365	375	365	380
252	375	380	375	380
288	367	375	372	370
344	360	367	365	365

1/ Modal averages.
Source: Priced auction catalogs of B. M. Spiers, Leon Van Parys, and Gerard Koninckx Freres, Antwerp.

Table 24.--Summer Oranges: Prices at Antwerp Auction by Size and Origin of Fruit, August 10, 1950
(Prices in Belgian francs per box)

Size 1/	California	South Africa		Brazil
	Valencia	Valencia	Navel	Pera
126		205		
150	285	235	235	220
176	300	265	267	240
200	300	280	270	260
216		265	265	270
220	300			
226				270
252	285	260	270	290
288	272	257		285
324		240		272
344	260			
360		220		200
442		152		

1/ Sizes of fruit are not exactly comparable.

Source: Priced auction catalogs of B. M. Spiers, Leon Van Parys, and Gerard Koninckx Freres, Antwerp.

A Comparison of Prices for Specific Dates for Certain Sizes

In order to have a comparison of the prices obtained for various United States citrus fruits compared with fruits from other countries we have selected for the comparison of grapefruit prices the sales of size 112 on January 6 and 31, 1949. Comparing the sales price of Texas white with that of Texas pink grapefruit on January 6, 1949, white grapefruit brought approximately 3.97 cents per pound, compared with 5.94 cents per pound for pink grapefruit. On January 31, 1949, Texas white grapefruit brought 6.79 cents per pound, compared with 7.68 cents per pound for pink grapefruit.

Comparing the price of oranges on November 9, 1949, in size 252, Texas oranges brought 6.79 cents per pound, Florida oranges 7.79 cents, California navels 12.43 cents and Brazilian Peras 8.17 cents per pound.

All these comparisons are, of course, averages of central tendencies indicated on the days for which prices were compared. On November 25, Cyprus ovals brought approximately 11 cents per pound, compared with 8.60 cents per pound for Texas Valencias.

On January 6, 1949, California navels brought 9.59 cents per pound, Texas navels 6.27 cents per pound, Spanish Cadeneras 9.66 cents, and Spanish navels 8.73 cents per pound.

On January 31, 1949, California navels brought 8.65 cents per pound, Texas Valencias 6.86 cents per pound, and Spanish blood ovals 8.60 cents per pound.

EFFECT OF EXCHANGE RATES ON PRODUCTION COSTS

In 1949 production studies were made of the citrus industries of North Africa including Algeria, French Morocco, and Tunisia and of the citrus industry of Spain. As a part of these production studies a calculation was made of the cash cost of production of oranges in 1949 and the cash break-even cost per 30-kilo or 66-pound packed box of oranges net weight, f.o.b. shipping ports. These calculated costs were converted into dollar values and are compared here.

The comparison of the cost of production in North Africa is very interesting: Tunisia has the highest cost because of its poor soil and lower yield per acre, French Morocco has the lowest cost of production on the tree, and Algeria is approximately an average of the other two. Comparing the break-even cost of packed fruit f.o.b. North African ports, the break-even costs of French Morocco and Algeria are practically the same since the primary citrus industries in Morocco are located at least 50 miles from the coast and the extra transportation costs about offset the Moroccan advantage in cost of fruit on the tree. Tunisia has the highest break-even cost f.o.b. port, and its lowest break-even cost is approximately equal to the highest break-even cost in Algeria.

All of these costs are expressed in terms of ranges as this seems to offer the most realistic presentation of cost factors. The majority of the fruit shipped from North African ports in 1949 probably had cash break-even costs within the ranges indicated. By "cash cost" is meant cash cost of operation eliminating such charges as interest, amortization, etc.

A comparison of North Africa and Spain illustrates a different situation. If the Spanish costs of production are converted at 16.45 pesetas to the dollar the break-even cost f.o.b. Spanish ports is higher than the break-even cost of North African fruit. However, by converting these costs at the turist rate of 25 pesetas to the dollar and at the free rate, which in 1 1949 was approximately 40 pesetas to the dollar, it will be noted that the break-even costs in Spain are either the highest or the lowest depending upon the rate of exchange. Therefore, in an unstable currency situation such as is the case in the economy of Spain, converted figures of cost have little real value. Perhaps the most realistic comparison of North Africa and Spain is one based on conversions at free rates of exchange. When the North African franc is converted at 320 francs to the dollar, and the peseta at 40 pesetas to the dollar, the break-even costs f.o.b. Spain are far lower than those of North Africa. Spain may be expected to be highly competitive when North Africa seeks to expand its market in metropolitan France and other Western European countries as its orange production increases.

Table 25.-Orange Production Costs, North Africa and Spain, 1949

Country	Production cost of fruit on the tree per 30 kilo (66 lb.) box		Break-even cost f.o.b. port per 30 kilo (66 lb.) box	
	High	Low	High	Low
	Dollars	Dollars	Dollars	Dollars
Algeria 1/	0.45	0.38	1.68	1.28
Tunisia 1/	0.94	0.79	2.17	1.69
French Morocco 1/	0.35	0.23	1.60	1.30
Spain 2/	0.78	1.07	2.76	2.04
Spain 3/	-	-	1.81	1.34
Spain 4/	-	-	1.13	0.84

1/ Converted at 320 francs to the dollar.
2/ Converted at 16.45 pesetas to the dollar.
3/ Converted at 25 pesetas to the dollar.
4/ Converted at 40 pesetas to the dollar.

Source: Compiled from official sources.

HEALTH PROGRAMS ARE INCREASING WORLD MARKETS FOR PROCESSED CITRUS JUICES

Health programs started since 1938 are changing the citrus-consuming habits in some European markets. The most outstanding example of this is the child health program of the United Kingdom, which will be discussed in some detail; however, other countries are also using orange juice concentrate for child health purposes. In 1949 Western Germany purchased some 500 metric tons of orange juice concentrate in Italy. This was supposed to have been used in a school lunch program. In 1950 Norway started an experiment using orange juice concentrate in a health program. 1/ The experiment is being conducted in the five northernmost counties of Norway and should give an excellent opportunity to evaluate the worth of orange juice concentrate as a source of Vitamin C. These experimental supplies of concentrate were obtained by Norway under program QMX 41A of the Department of Agriculture.

The interest in such health programs is evidence of some change in European appreciation of diet and health. During the war years some Europeans became familiar with canned citrus juices for the first time, as such products were a part of army and relief supplies.

During wartime, fresh citrus shipments were halted to most European consuming areas, and when citrus again became available after the war, a pent-up hunger for citrus products was expressed in the accelerated demand. Where countries had sufficient foreign exchange to make large citrus imports, consumption of both fresh fruit and juice products reached the highest levels in history.

After 1947, when this pent-up demand had been satisfied, consuming levels remained high where citrus was available. A significant change took place in European citrus consumption and citrus juices were consumed to an extent not known before the war. In the United Kingdom the increase was primarily in the form of orange juice concentrate made available to mothers and children; on the continent of Europe this increased orange juice consumption was expressed in the greater utilization of citrus juices in soft drinks. Consumption of "squashes" and other soft drinks flavored with citrus juice is continuing to increase, and in some of the northern countries the consumption of these soft drinks is larger than that of beer for the first time 2/.

1/ See Some Observations on the Citrus Market Situation in Norway, Foreign Agriculture Circular FCF 8-50, Office of Foreign Agricultural Relations, U.S.D.A., Washington, D. C., December 22, 1950.

2/ For further information on processed citrus markets in Norway, United Kingdom, Belgium, Denmark, Sweden, Netherlands, Switzerland, and Western Germany see Foreign Agriculture Circulars FCF 8-50 through FCF 15-50, Office of Foreign Agricultural Relations, U.S.D.A., Washington, D. C., December 1950.

This increasing tendency to consume citrus juices is likely to change the character of European citrus markets. In the past, most of the citrus juices were preserved with sulphur dioxide, and this type of product is still a major source of supply. As the use of citrus juices increases, countries are raising their standards; some will no longer accept this older type citrus juice and have altered their regulations permitting only the import of pasteurized products, packed in cans. It would seem, therefore, that in the future the older type sulphur dioxide preserved juices will be in a less favorable competitive position than in the past.

United Kingdom's Child Health Program

One of the most interesting recent developments in the consumption of processed citrus products is the use of orange juice concentrate in the United Kingdom's child health program, which was developed during the war to safeguard child health during periods of short supplies of fresh fruits containing Vitamin C. The origin and operation of this program together with the position of the British Ministry of Food regarding the source of supply, are described in British Ministry of Food Bulletin No. 479 (see appendix).

The present child health program in England developed during the war to protect the health of mothers and children against dietary deficiencies. During the war most citrus juice for this purpose was obtained from the United States, but since the war the United Kingdom has attempted to develop nondollar sources of supply, particularly in the West Indies.

The quantity of orange juice and concentrate for the health program supplied by the United States during the war is indicated in Table 26.

The health program has become very important to the British Commonwealth and it may be expected that it will be continued and possibly expanded in the future. From indications of wartime supplies and recent purchases it may be estimated that the health program consumes between 3 and 4 million gallons of orange juice concentrate per year.

The orange juice concentrate for this program is bottled under contract with the Ministry of Food, and the way in which the product is prepared for the consumer was observed during a visit to one of the plants.

Table 26.-Canned Citrus Juice and Concentrate: Lend-Lease Shipments from the United States to the United Kingdom, 1942-46

Period	Orange juice	Orange concentrate	Grapefruit concentrate	Lemon concentrate
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
Through Dec. 1942	677	17,219		2,492
Jan.-June 1943	241	20,436	669	2,038
1943-44 1/	2,536	36,887	460	2,971
1944-45 1/		17,332		273
1945-46 1/		6,708		

1/ Year beginning July 1.

Source: Bureau of the Census.

Bottling the concentrate. As supplies are received in Britain, the concentrated orange juice is thoroughly tested, and the results are recorded. Supplies of concentrate are shipped to bottlers by the Ministry of Food, and an attempt is made to keep at least 2 week's supply on hand at the bottlers. Usually a high ascorbic acid concentrate is combined with an orange concentrate of a low ascorbic content to obtain a blend which meets the minimum requirements of the British Ministry of Food.

The concentrate when received in England is placed in cold storage at 36° F. It is not refrigerated after it is taken from the warehouses and sent to bottlers; at the plant visited the product was stored in a shed outside the plant. Natural conditions probably keep the concentrate at approximately 45° F.

Upon arriving at the bottlers, the products are again tested for Brix, soluble solids, citric acid, ascorbic acid, and also fruit cells and yeast content. The Stephens Potato Agar Test is used for yeast, and the size of fruit cells is measured by passing the concentrate through a 16-mesh screen. The results of a test of Palestine and Florida concentrates are given below:

Kind and quantity of juice	Ascorbic acid mg/100 gm.	Citric acid Percent	Brix
60 tins "Palestine" (#10 3/4 U.S. gal).	203	5.73	64.0
90 tins "Florida" (#10 3/4 U.S. gal).	236	5.27	65.0

On the basis of tests such as this, the blend of juice is determined and a mixing batch formula is made up.

The two formulas below were made in the laboratory after the completion of tests.

1st Batch

70 tins (cans)	Florida	(#10 - 3/4 U.S. gallon)
70 tins (cans)	California	(U.S. gallon)
2½ lb.	Sodium sulphite	
2½ lb.	Citric acid	
243 lb.	Sugar	
149 lb.	Water	

Water is sterilized by making simple syrup at 110° C.

2nd Batch

90 tins	Florida	(#10 - 3/4 U.S. gallon)
60 tins	Palestine	(#10 - 3/4 U.S. gallon)
2½ lb.	Sodium sulphite	
7⅕ lb.	Citric acid	
177 lb.	Sugar	
131 lb.	Water	
28 gm.	Ascorbic acid	

This second formula makes a 120 Imperial gallon batch.

In the batch mixing room, the tables on which the tins are opened as well as the vessels used in mixing are all stainless steel. The floors are hosed at frequent intervals, and high standards of cleanliness are observed. The tins of concentrate are brought to the mixing room from storage and each can is inspected upon opening. Badly stained cans and leaking cans are not used. It has been observed that the concentrate immediately surrounding the dents in badly dented cans may be discolored. When this occurs it contaminates the whole can.

After the cans are opened and inspected, the contents are emptied into a "stock pot," and the can is scrapped in order to utilize as much material as possible. The concentrate is emptied into the mixing vat containing the chemicals and simple syrup. The batch is then mixed, being stirred mechanically by stainless steel revolving paddles. Upon completion of the mixing process, the batch is pumped to the bottling room where the product is placed in sterilized bottles.

In 1949 the plant visited was using hand capping and automatic labeling machines. The labeled bottles are placed in cardboard containers.

The finished product is again tested for yeast, Brix, citric acid, and ascorbic acid, flavor, fruit cells, sulphur dioxide, and pH.

A sample of each batch is kept by the bottler to determine whether the quality of the product is being maintained.

Laboratory technicians stated that high standards of quality control are necessary for efficient operation. For example, they make spot tests of the air in the plant by exposing a culture for 2 minutes in order to determine the presence of air-suspended matter. Air contamination is controlled by air filtration in the plant.

Each day all pipes are cleaned with steam, all floors are washed and steamed in the mixing room.

Bottling is done under contract with the Ministry of Food by pharmaceutical firms in the business of packaging and manufacture of pharmaceuticals or babies' food.

Upon inquiry as to the type of concentrate desired, the following requirements were suggested: (a) a concentrate should have as high a Vitamin"C"content as possible with a satisfactory shipment averaging better than 235 mg/100 gm. in ascorbic acid and not less than 220 mg/100 gm. of ascorbic acid; (b) the concentrate should be low in acidity, not too thick, and pour easily; (c) fruit particles should be kept to a minimum.

Approximately thirty 6-oz. bottles of mixed concentrate are produced from 1 U.S. gallon of concentrate.

It is estimated that the cost of a 6-oz bottle of mixed concentrate is about 2s. 6d. ($0.35), which covers all cost including advertising.

Reconstituted orange juice has good flavor except for a slightly "cooked" taste.

Supplies are distributed so that the product should be consumed within 4 months after bottling. The concentrate is bottled for use by the consumer in accordance with the directions on the label.

Instructions on Bottle Label

Ministry of Food
CONCENTRATED
ORANGE
JUICE

6 fl. oz.

Always mix the juice just before use with 4 to 6 times as much water, which has been previously boiled and then allowed to cool a little. Sweeten with a little sugar, if necessary.

To be given as follows:

Babies (1 to 6 months)
Start with about 3 drops of the juice diluted with water, as instructed above. Increase gradually to 1 teaspoon of the juice daily, diluted as above.

(Continued)

(Continued)

After 6 months

Increase gradually from 1 to 3 teaspoonfulls daily diluted with water as above.

Expectant mothers

One tablespoonful with water daily.

This juice contains not less than 60 mg. of Vitamin C per fl. oz. It is sweetened with added sugar and contains not more than 0.035 percent sulphur dioxide.

Bottled by _____

Keep in a cool dark place. Please rinse and return the empty bottle.

United Kingdom Market Prospects

Through the extensive utilization of processed citrus products in squashes and the child health program it would seem logical that a desire to consume more citrus would be created and the potential demand for citrus in the United Kingdom would be increased considerably. It is also entirely likely that the child health program which is now in effect for children up to 5 years of age may be extended to include all children under high school age.

The United Kingdom is attempting to develop commonwealth and soft currency sources of supply for orange juice concentrate but present indications are that these sources will be insufficient for several years and that important supplies of orange juice concentrate will continue to be purchased in the United States.

As the "squash" industry grows, there will be increased opportunities for the sale of concentrates in England. If dollars were available to make purchases, the consumption of processed citrus juice products would be much higher than at present.

APPENDIX

THE ORANGE AS A SPECIFIC *

"Over 170 years ago, when Captain Cook was making his voyage of discovery in HMS Endeavour, only one man of his entire crew died from scurvy during a voyage of three years. This was remarkable in times when the disease was the scourge of the British Navy. He kept his men free of it by giving them concoctions of fruit and vegetables and by buying and distributing fresh fruit to the crew whenever possible. In 1795 The Admiralty decided that a regular issue of fruit juice must be made to all sailors. The result was that soon after the turn of the century the Naval hospitals were free from cases of scurvy.

"Advanced scurvy is seldom seen today, but nervous restlessness, a lack of energy and a poor skin may easily mean a shortage of fresh fruit and vegetables in the diet. A peevish, lethargic child is probably suffering from a shortage of Vitamin "C." This anti-scorbutic vitamin is contained in concentrated orange juice as well as in fresh fruit and vegetables.

THE NEW WORLD TO THE RESCUE

"During the war of 1939-45 the supply of oranges to the U. K. was in grave danger of drying up. Hostilities in the North and South Atlantic, the Mediterranean and the Indian Ocean made it difficult for shipments from Africa, Palestine, Spain, and Australia to reach this country. Alternatives to orange juice, such as blackcurrant puree, were used, but the Government considered orange juice to be so important to the health of mothers and children that it was deemed essential to include it in the cargoes of ships ploughing their way across the North Atlantic from the United States through all the hazards of war at sea.

"The oranges were processed in America, being first graded - the bad fruit being rejected and the good fruit washed. This washing process is one of the most important stages in the preparation of the concentrated juice. The yeast cells in dust and in the air must be destroyed before the fruit is cut; if they get into the fruit, they cause fermentation by decomposing the sugar into alcohol and carbon dioxide. The juice is then extracted and, because air oxidises Vitamin "C," it is passed through a de-aerator. Finally the juice is concentrated, flash pasteurised, cooled and canned. Orange juice from the United States has to be blended in order to obtain a standard Vitamin "C" content and is bottled in this country.

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* British Ministry of Food Bulletin No. 479, London, January 10, 1949.

"The war having ended in 1945, and with it Lease-Lend, Britain began to look again to its original sources of supply, though the dollar purchases of orange juice continued. Balance of payment problems, political disturbances in Palestine and other difficulties in South Africa made the job of assuring the supply of orange juice a difficult one. As it is still necessary to import several thousand tons of orange juice from the U.S.A. in order to maintain the Welfare Foods Service, extensive development in sweet orange production in nondollar countries was of the utmost importance. A survey made in March and April of this year revealed the prospects of developing the production of citrus fruit in the West Indies. Attention became focussed on Jamaica, Trinidad and British Honduras and plans were laid to bring the glint of golden oranges to the wharfs and quays of the Gulf of Mexico, long forsaken by the glitter of doubloons and pieces of eight.

THE WEST INDIAN CITRUS INDUSTRY

"Citrus production in the West Indies is scattered over a wide area. It is estimated that about 8,700 acres are under cultivation and in addition to this about 10,000 acres in Jamaica are growing wild. Growers have for some time shown a very natural fear of American competition and have been reluctant to put further money into increased plantings without the assurance of a market for their produce. Yields have been comparatively low. For instance in Jamaica, the present average yield of an orange tree is about half a box of fresh fruit per season, whereas, with proper cultivation and attention, a good tree should yield about three boxes of fruit each year, a box of fruit normally weighing about 90 pounds. In Trinidad the yield is somewhat higher owing to the better condition of the trees, which are fertilized immediately they come into bearing. It is said that it is not necessary to do this beforehand, as many of the new plantings in Trinidad have been made on old cocoa land, where the soil is very rich. In British Honduras, where a large scale planting programme is at present being undertaken, it is hoped to have some 5,000 acres of oranges under cultivation in five years' time.

"Given marketing incentives and some assistance in the supply of fertilisers, etc., there is reason to hope that growers in these areas will raise the yield per tree to the level of some three boxes per year.

THE TEN-YEAR AGREEMENT

"The survey that was made earlier this year showed that West Indian growers would be ready to undertake increased production provided they were guaranteed a market and that some formula for the annual revision of prices could be incorporated in any proposed contract. The negotiations which followed culminated in the Minister's announcement on November 29th, 1949, of a ten-year agreement for a maximum of 5,000 tons of concentrated orange

juice a year from the West Indies. This contract is in the form of a guarantee to take orange juice for the Welfare Foods Scheme in the U. K. and contains a formula for the annual revision of prices during the first five years. A fresh formula for the remainder of the contract will be worked out later on.

"Orange growing on a commercial scale in the West Indies is confined to Jamaica, Trinidad and British Honduras and it has been agreed that during the next ten years Jamaica should undertake to supply 2,750 tons, Trinidad 1,500 tons and British Honduras 750 tons of concentrated orange juice per year for Britain's Welfare Foods Scheme.

A SAFEGUARD FOR THE FUTURE

"The results of this contract will be three fold. In Britain's fight for recovery, the reduction of hard-currency expenditure is essential but any cancellation or reduction of the existing welfare scheme might undermine years of painstaking labour in nutritional education and, as the scheme has now become an established form of family benefit, would cause legitimate resentment on the part of the public. The new contract will safeguard the supply of orange juice and will do much to make this country independent of hard currency areas from which this commodity is obtained. It is also reasonable to suggest that the contract will put new heart into the West Indian growers, encouraging them to improve their methods and to increase production with considerable material benefit to themselves. Finally, the increasing supply of concentrated orange juice over the next five years or more will enable the U. K. to maintain the health of young children and expectant mothers at the high level which it has reached since the Welfare Foods Service began."